

IN farmer

INTERVIEW

with the president of the German
Biogas Association Mr. Seide

PSM MIXER TECHNOLOGY

Intelligent technology

SERVICE-BOX PRO

Patented system

UTS REFERENCE PROJECT

Eggertshof







Dear customers,
Dear UTS fans,

I would like to thank you all. The feedback we received on the first two issues of INfarmers was overwhelming. The discussions we were able to have with you were substantial, forward-looking, encouraging and constructive. This magazine is a communication medium in which we bring together what is important to you and to us: technology, the latest insights and developments in our industry, success stories by and with you, and news from our parent company Anaergia. We are very pleased that all this is met with so much interest on your part and that a cycle seems to be closing.

A closed cycle is the idea of the ideal biogas plants for all of us. This requires many willing hands, courageous decisions and strong cohesion of all those involved in the creation of value. So, if we want to continue our biogas history in a positive way, we should all move closer together. Because biogas and anaerobic digestion have a future and we can shape it together.

All the more I am again pleased to present to you different perspectives in this issue: starting with the incredible history of a 600-year-old farm that has already experienced a lot as a biogas pioneer; about our German biogas association president, Mr. Seide, who gives interesting insights into the post-EEG phase in this interview; or our man of the first hour in the north-east of Germany in sales and service; to insights into a waste plant in Cardiff and the latest findings of a promising technology in the form of our PSM agitation technology.

All these stories show me and I believe you too that this industry has huge potential and all of us can shape the future of biogas in a positive way. My plea to you: please challenge us every day so that together we can present a sustainable solution to climate change and the latest movements. Years ago, this industry already demonstrated that it is possible to break down borders in the long term and be a climate-neutral alternative.

I wish you a lot of fun reading and discovering where the road will lead to. Please keep on letting me know if you enjoyed the INfarmer and maybe next time we will tell your success story.

With the best regards

A handwritten signature in blue ink, appearing to read 'St. Kaiser'.

Stefan Kaiser
Managing Director of UTS Products GmbH



INTERVIEW PRESIDENT
OF THE GERMAN BIOGAS
ASSOCIATION MR. SEIDE

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EGGERTSHOF

THE BIOGAS INDUSTRY PIONEERS

EGGERTSHOF UTS BIOGAS PLANT PROJECT

THE BIOGAS INDUSTRY PIONEERS



There will always be people who lead the way. The first people to fly, to walk on the moon, or to land on a new continent. Others might think that they are reckless or downright crazy.

We have a saying: everybody said it wasn't possible until someone came along who didn't know it wasn't possible and did it. Josef Pellmeyer always knew what he was doing. In 1983, he and his wife took over the now 600-year-old Eggertshof

farm from his parents. The couple invested a lot of time, energy, money and ideas to secure the future of their agricultural family tradition. They also decided to diversify so that they would not have to depend on only one source of income any longer.

Biogas plays an important role in the business strategy of the Pellmeyer family whose farm is now in the hands of their son Michael and his wife Natalie. Josef Pellmeyer

built a biogas plant on the Eggertshof farm as early as in 1996, making the farm independent of oil and gas. To this day, this initial plant has been continuously optimised and kept up to date with the latest technology. UTS assisted the Eggertshof farm and the Pellmeyer family with this.

A SECOND PLANT

In 2004, the conditions for investing in new biogas plants were very



Aerial view of the Eggertshof



good thanks to new legislation (of 2000 and 2004) on feeding power into the grid.

Josef Pellmeyer had been the Chairman of the German Biogas Association since 2001 and seized the opportunity to build a new, state-of-the-art biogas plant, once again hiring UTS. Having worked together for several years, they had come to appreciate each other and it was clear that UTS, with its design expertise and leading biogas technology, would be able to make an optimum contribution to the success of the plant.

Not only was a new plant to be created, but it should also be an extra source of income for the Eggertshof. Biomasse Kraftwerk Eggertshof GmbH & Co. KG was established and put the new plant into operation in 2006. The plant, which runs on renewable raw materials, has been fermenting approx. 14,000 metric tons of forage maize and approx. 4,000 metric tons of grass into approx. 1.8 million m³ of biomethane a year since then.

THINKING BIG

The Pellmeyer family harvests the raw materials for their biogas plant from early summer to early autumn. The grass and the chopped maize are

ensiled on an immense outdoor storage area in order to have sufficient stock to last until the next harvest. After all, the plant with its two large fermenters and one secondary fermenter must be fed every day. The raw materials from the silage area are fed into a solids dispenser by a wheeled loader, from where screw conveyors and conveyor belts transport them to the fermenters. They are designed with only one purpose: to achieve a maximum gas yield with the minimum energy consumption using UTS technology. The mixers ensure optimum fermentation, the service boxes minimise gas losses during maintenance work, and the continuously used UTS pumps ensure that the entire process takes place smoothly and reliably.

In addition to UTS technology, there is yet another component that plays a central role for the efficiency of the plant: process heat. The fermentation process requires a temperature of around 40 °C year round in the containers. This is where the combined heat and power unit (CHP) that belongs to the plant comes into play. The biogas produced drives two 370-kW MAN gas engines, which in turn drive a generator that produces electricity. The waste heat from the engine is used to keep the fermenters at the right temperature.

The entire energy potential introduced into the plant is put to highly efficient use.

RICH HARVEST

And what does the system bring? To begin with, the plant produces approx. 5,800 MWh of renewable electricity per year, which is sufficient for the needs of some 1,500 households. In addition, approx. 6,000 MWh of thermal energy is generated which is used for the fermentation process and for drying both the fermentation residues in the fermentation residue tank and wood chips. The fermentation residues stay in the plant's 5,609 m³ fermentation residue storage facility for some 180 days. The MKR vacuum evaporator, which extracts additional moisture from the fermentation residues, is a special technical feature.

THE ADVANTAGE:

Weight and volume are reduced, simplifying handling and fewer trips are needed to spread the fermentation residues as natural fertilizer onto the fields of the Eggertshof and neighbouring farms. That is a positive effect, as is the fact that the quality of the soil in the area has been continuously improved by these fermentation residues, doing away

with the need to purchase expensive artificial fertilizers.

The fermentation residue storage facility in the plant is also a gas storage facility. From here, the gas is fed to the CHP via pipelines that optimise the calorific value of the gas by cooling and dehumidification. A positive effect of the Eggertshof biogas plant for the environment and the climate is that it achieves significant annual CO₂ savings of 5,000 metric tons compared to conventional energy generation using fossil fuels.

MODERN GAS TREATMENT

Biomasse Kraftwerk Eggertshof GmbH & Co. KG has been working together with Munich's municipal utilities, i.e. Münchener Stadtwerke (SWM), since 2010. The latter indicated to the Pellmeyer family that they were willing to buy the surplus gas produced by the plant.

To this end, the Munich utilities invested in a state-of-the-art gas treatment and network entry plant which was built on the Eggertshof and connected to the biogas plant through a gas pipeline. The treated raw gas is fed into the H-gas network of Erdgas Südbayern as high-quality biomethane (methane with a purity of over 99%) at a maximum network pressure of 16 bar. SWM uses the gas quota for the CO₂-neutral operation of a 370-kW CHP unit at Munich's Michaeliabad pool, which is some 30 km away. The electricity produced is fed into the SWM's grid and the heat covers a considerable part of the pool's heating requirements.

This flagship project in Eggertshofen shows how versatile the use and advantages of a sustainably designed biogas plant, combined with sophisticated technology, can be. And one of the best things is that this benefits an entire region in the form of renewable energy, sustainably farmed land, and an improved CO₂ balance. ■



Gas processing plant



Michael Pellmeyer, Nathalie Pellmeyer, Michaela Kaniber (minister for agriculture, Bavaria), Elvira Pellmeyer and Josef Pellmeyer (from left to right)



600TH ANNIVERSARY OF THE EGGERTSHOF

HONOUR TO WHOM HONOUR IS DUE!

A farm reaching the venerable age of 600 years old is a very good reason to celebrate.

That's why two generations of the Pellmeyer family, the owners and operators of the Eggertshof farm, decided to organise a public celebration on the last Saturday of June of this year, followed by an open farm day on Sunday. The Pellmeyers' invitations were well received. Visitors included the Bavarian Minister of Agriculture Michaela Kaniber, the Minister of State Florian Hermann, the President of the Bavarian Farmers' Association (Bayerischen Bauernverband) Walter Heidl, the President of the Biogas Association (Fachverband Biogas) Horst Seide, the Mayor of Freising Tobias Eschenbacher, the local priest Peter Lederer, and many, many other guests of honour. There was a lot going on at the Eggertshof on these two days.

A FARM OF IMPORTANCE

There is a good reason why there is so much public interest in the Eggertshof. It starts with its history.

The farm dates back to the Middle Ages. First mentioned in an official document in 1418, the Eggertshof started out as the „hunting lodge“ of the Prince Bishops of Freising. The land and the farm became private property in 1633 and they have been owned by the Pellmeyer family since 1918. The Eggertshof survived the 30-year war, two world wars, as well as medium and major catastrophes such as the BSE crisis in 2000 and a major fire in its composting hall in 2003.

But rather than concentrating on surviving, the recent history of the farm has been characterized by optimistic, constructive shaping of the future. One thing that is typical of the Eggertshof and the Pellmeyer family is the courage to look ahead. Since the mid-1980s, they have managed to shape the transition from a traditional agricultural enterprise to a broad-based modern company. Minister Michaela Kaniber paid respect to this in her welcoming speech. She called the Eggertshof an „inspirational undertaking“ and said that the Pellmeyer family were an „example

of best practice“, since the Eggertshof now represents three companies and three sectors: Eggertshof Agrar is an agricultural company, Eggertshof Bioenergie GmbH & Co. KG produces, uses and sells renewable energy and Entsorgungs- und Verwertung GmbH Eggertshof recycles all kinds of waste.

EXPERIENCING THE EGGERTSHOF

In order to show local residents what the Eggertshof has become and what it is doing, its doors and gates were opened to the public for one day as part of the anniversary celebrations. To present the four key themes, i.e. agriculture incl. livestock farming, biogas plant with waste utilisation/fermentation product evaporation, composting plant and wood utilisation, as well as biogas plant with renewable raw materials, several presentations, guided tours and several stands were organised where various organisations from these fields showed off what they did (Bauernverband, Jungbauernschaft, Maschinering, Berufsgenossenschaft,



Michael Pellmeyer, Elvira Pellmeyer, Michaela Kaniber (minister for agriculture, Bavaria), Josef Pellmeyer and Horst Seide (president of the German Biogas Association) (from left to right)

proGesund, Landeskuratorium der Erzeugerringe für tierische Veredelung in Bayern e.V. (LKV), Zuchtverband, Bayerische Landesanstalt für Landwirtschaft (LfL), Fachverband Biogas, Stadtwerke Freising, Fachvereinigung Bayerischer Komposthersteller, Waldbesitzervereinigung).

Of course, as a long-standing development, technology and service

partner to the Pellmeyer family, we did not want to miss out on this chance to present UTS to the public with our own stand. After all, it is a rare occasion that people can experience so much biogas power in one place. The festivities were a great success and drew attention from way beyond the municipal, district and federal state borders. Ever since Josef Pellmeyer built the first biogas plant on the Eggertshof

farm in 1996, many experts and delegations have visited the farm to learn more about this subject. In 2004, the Eggertshof even welcomed the then Chinese Prime Minister Wen Jiabo and the then Bavarian Prime Minister Edmund Stoiber who wanted to get an idea of new ways of sustainable energy production themselves. Many guests have followed them to come and see how things can be done differently. ■





INTERVIEW

PRESIDENT OF THE GERMAN
BIOGAS ASSOCIATION MR SEIDE

Mission Statement of the German Biogas Association

Who we are: The German Biogas Association brings together and represents the interests of more than 4.700 members such as substrate suppliers, plant planners and constructors, biogas plant operators, energy providers, and people from research and development as well as public bodies on a national and international level. We create platforms for exchanging opinions and knowledge and bring together the expertise of sector by coordinating industry stakeholders.

INTERVIEW WITH THE PRESIDENT OF THE GERMAN BIOGAS ASSOCIATION MR. SEIDE

THE FUTURE OF BIOGAS



Mr. Seide,

the biogas industry is on the brink of yet another major change. Operators and manufacturers are wondering: What does the future hold for biogas? The Fachverband Biogas (German Biogas Association) and all its stakeholders are working hard to raise the general awareness of biogas as it is an important component in the energy mix. After all, renewable energy is about more than just wind and solar energy.

What do you consider to be the main arguments in favour of biogas plants and their continued existence? What are the Biogas Association's views on the future of biogas?

The current energy transition is in full swing and it will be different from the previous one. The challenges for the next decade and beyond are issues that our biogas plants will be able to handle very well. Some examples of these challenges are the stabilising of the electricity grid or providing heat in an affordable and climate-friendly way. This means that biogas plants will continue to be indispensable to enable the goals of the energy transition to be achieved.

Fridays for Future have set the climate protection debate in motion! Does the Biogas Association support this initiative? And if so, what exactly do you think will be the benefits for our

industry? What contribution can biogas plants make and what limitations can the environmentalists' demands pose?

The Fridays for Future movement has been very useful for our industry and as a trade association we have encouraged our members to join the demonstrations. Young people have pressured politicians into taking action. Of course, these young people were hoping for more, but it can't be denied that the demonstrations have brought about some change. This is really positive for renewable energy, also for our biogas sector.

We would like to counter any criticism from nature conservationists by explaining the solutions we offer. Let's take the example of flower strips or fields with wildflowers. These flowers can be used to produce energy in our biogas plants. Forcing our farmers to grow flowers will be good for bees and insects, but it will have a financial impact on farmers.

We believe that current programmes which promise farmers a certain amount of money per hectare if they let flowers rot in their fields are creating false incentives. Letting the flowers rot is bad for the CO₂ and nitrous oxide emissions balance. It would make more sense to bring the withered flowers to our biogas plants as this would benefit us all.

We are currently testing several different flower mixtures with our operators. This is not scientific research, but it is a learning by doing approach. Different mixtures are used in various locations all over the country, from north to south, in order to find out which flowers grow best where, and which ones are useful for energy production.

We are trying to make it clear to politicians that biogas plant operators should be allowed to use flowers from flower strips and wildflower fields in their biogas plants. There is definitely room for improvement as far as this and other issues are concerned.

When looking at our industry, do you see any weak points that operators and technology suppliers should specifically address?

There's not this ONE weak point that we can focus on. However, emission reduction is a topic that should be given specific attention. We have also noticed this in connection with the current, 44th BImSchV (Federal Immission Protection Ordinance). It is very likely that this will not be the last time that biogas plants will be required to reduce their emissions. It is a long way from fermentation to the motor in biogas plants. Therefore, both operators and manufacturers need to step up their efforts to reduce emission sources as much as possible.

We, as the Biogas Association, are involved in scientific accompanying research for determining and evaluating emission sources, i.e. which emission sources are relevant and how relevant they are. We have already recorded the first results, but this process is still ongoing. We expect that a publication will be issued by around mid-2021

What do you think about the issue of intra-agricultural competition and competition for land?

Biogas plant operators and farmers should stop seeing each other as competitors. I think that biogas

technology offers agriculture an opportunity to overcome the current and future challenges.

Let's take the Fertiliser Regulation as an example. Farmers in red areas, i.e. regions with a high concentration of livestock, can be supported by biogas plant operators to help them manage their manure. A positive side effect of this is that valuable energy is produced and methane emissions from livestock farming are reduced.

As is often the case, there will not be one single measure that works equally well for all farmers and biogas plant operators, but there are still many issues that are easier to solve together instead of trying to solve them on our own

Flexibility premium subsidies for biogas have been exhausted. The flex lid is closed. What do you think is the significance of the flexibilization of biogas plants for the energy mix? Is this topic already a thing of the past? Or to put it differently: What future compensation do you envisage for the energy produced by biogas plants?

I think this lid - to put it bluntly - is nonsensical. Politicians are talking about how we can make more capacity available. Let me give you an example. In addition to the existing Irsching 4 and 5 gas and steam turbine power plants, another 300MW Irsching 6 gas-fired power plant is to be built in Upper Bavaria. But the biogas plant operators in Bavaria are already in a good position to provide the required energy. And we can do this at considerably lower costs and in a shorter time than the construction of a new power plant would involve.

Even if the flex lid is closed, this discussion is definitely far from over.

The amended Fertiliser Regulation is also important for biogas plant operators. The „red zones“ in particular are facing

major challenges. Which measures does the Biogas Association recommend should be taken in order to comply with the requirements of this fertilisation legislation? Fermentation product processing, marketing, storage?

The Deutsche Bauernverband (German Farmers' Association) and the Biogas Association have been pursuing a common goal for more than a year: slurry should be covered.

In the next 10 years, we want to achieve that at least 50% of all slurry is covered in biogas plants. We have reached the point where these endeavours have also reached the political sphere and are beginning to bear fruit. Various paragraphs of the Climate Change Package mention slurry in conjunction with biogas plants. We have reached a point where politicians have realised that we have to introduce the slurry into our biogas plants. This is an important step in the right direction.

However, as mentioned before, there is not a single measure that represents the best solution for all parties concerned. We therefore have to find separate solutions for the individual regions such as a storage facility for an arable farming region. At this stage, it would be a nice idea to have several farmers share a storage facility at a biogas plant. However, such a solution is not helpful for regions with a lot of livestock as their nutrient density is simply too high. Again, technical solutions, such as processing techniques, are needed to make fertiliser easier to transport.

The agricultural and biogas sector is currently offering us many approaches. And this makes me really proud of our industry, as I see that companies are giving a lot of thought to how we can solve these challenges together. And here I'm thinking of the first plants that are now entering the market with solutions for nitrogen reduction, phosphorus reduction, separation, full-scale treatment ... and these are only the first initiatives.

I am convinced that our biogas industry will provide a solution to this issue. Considering what we built ten or twenty years ago and where we are now, we can look forward to some great new developments in the coming years. We still have a lot of innovations ahead of us!

Is there anything else in terms of technology that operators should take to heart in order to secure the futures of their plants, e.g. with regard to increasing the efficiency and effectiveness of their plant operations?

Again, a general recommendation is difficult due to the highly diverse ways in which biogas plant operators are structured. However, the general increase in effectiveness is obviously something that they all have in common. Of course, an operator of a 75kW plant will never be as concerned about marketing their electricity as someone who owns a 1MW plant, but I am convinced that we will experience great leaps in all areas. As I already indicated before, there will be considerably more innovations and at an increasingly faster rate.

Digitisation is an area that I find exciting. Of course, we can already kind of „remotely control“ plants now, but this is just the start. The future will be that all our products, i.e. electricity, heat, gas, etc., will be offered for sale and digitisation can help us to a great extent in this respect. Companies that manage to sensibly combine the two topics of sales and digitisation for farmers and operators will certainly have a good future ahead of them.

Digitisation will have its effect on all aspects of biogas plants. An example of this is the mixing technology in our plants. I'm quite certain that there's still plenty to be optimised in this respect. For instance, we might combine digitisation and electricity sales, and thus extend the existing needs-based electricity supply where an automatic process shows operators when to feed electricity into

the grid so that they'll get the best possible prices. This is one of the many aspects where the right technology, i.e. feed technology, pumping technology, mixing technology and so on, will be very important.

Even although our industry has already gone through several changes, I believe that even greater changes await us in the future. And I definitely mean that in a positive way.

We have all experienced and achieved a great deal together over the past two decades. What do you consider to be the main issues for the time after the EEG?

Even if the EEG would no longer exist in its current form, there will be other guidelines and directives to regulate the market, in the way that tenders are already doing now. I don't believe in a free market. But, and this is a message that politicians have already made quite clear: the market will become less

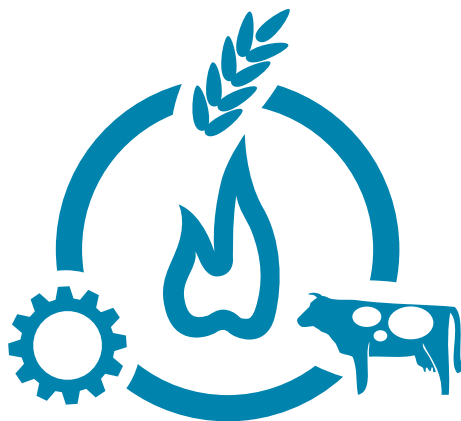
regulated. We have to sell the products we produce, i.e. electricity, heat, mobility, gas, and our biogas plants offer a wide range of possibilities. As an industry, we have to take responsibility for these sales. There will be operators who are very keen to sell, and on the other hand there will be those who would be less interested in this issue and need support. This in turn is an opportunity for our producers.

These new challenges will change our industry to a certain extent. The pure production of raw materials will become a thing of the past. And this will be a challenge for all forms of renewable energy equally. So I can only call on all stakeholders to view these aspects as an opportunity, to consider how to best respond to the new challenges at their own plants, to think ahead and to fully leverage the benefits offered by our biogas industry.

Biogas offers some great possibilities in the future world of renewable energy!

At the conclusion of the Gas 2030 dialogue process, Peter Altmaier, Federal Minister for Economic Affairs and Energy, recently said „Gas is sexy“. Biogas plays an important role in this and we can definitely consider the outcome of these dialogues to be a success. If you study the paper in detail, you will see that biogas will be part of the solution for the energy sector in the future. However, the focus will be less on our electricity and more on heat, gas and electric mobility and green gases. These areas will become significantly more important for our industry in the future. The demands set by politics are changing and it would make sense for us to recognise this and keep ahead of the game

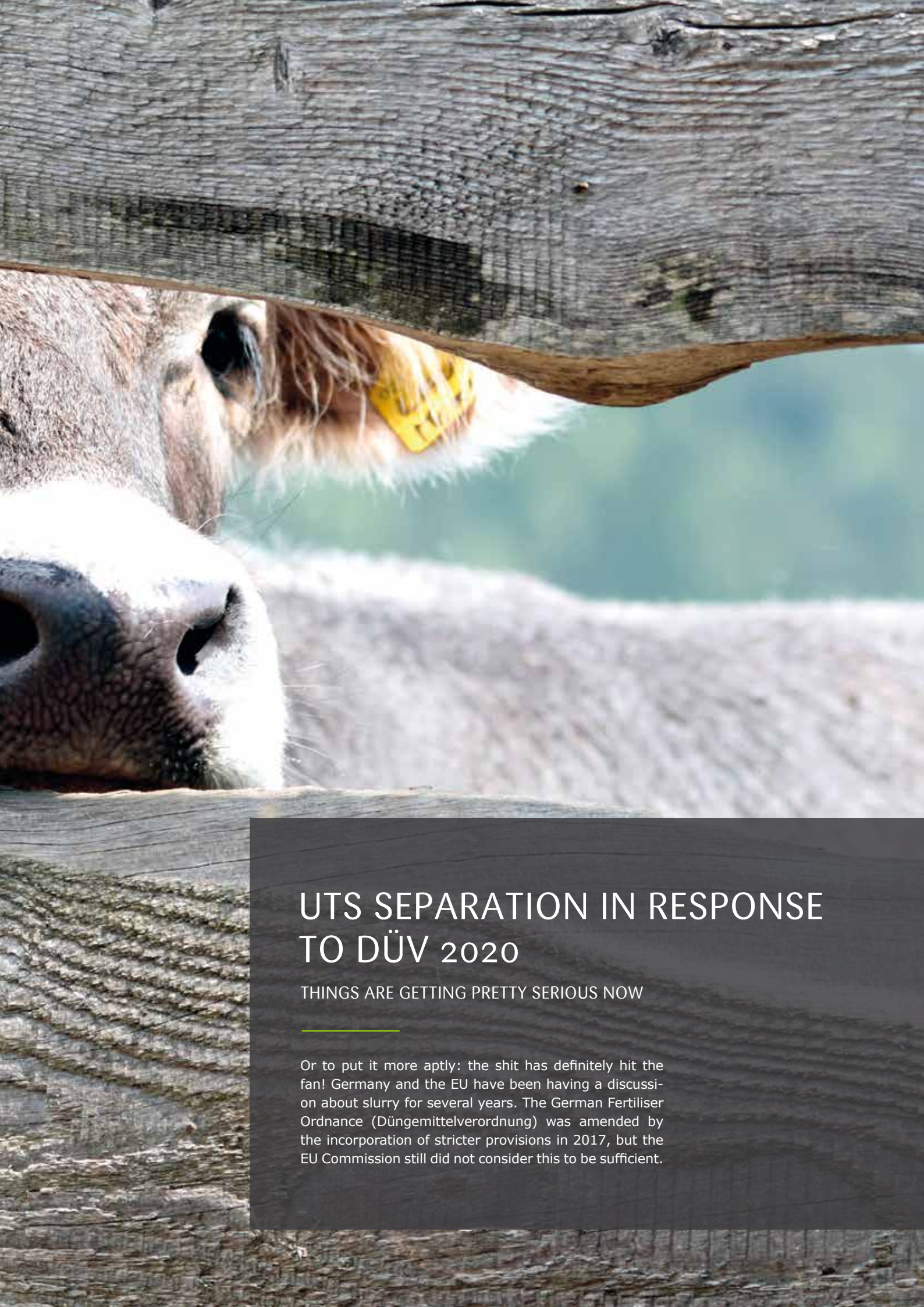
Thank you, Mr. Seide!



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UTS SEPARATION IN RESPONSE TO DÜV 2020

THINGS ARE GETTING PRETTY SERIOUS NOW

Or to put it more aptly: the shit has definitely hit the fan! Germany and the EU have been having a discussion about slurry for several years. The German Fertiliser Ordinance (Düngemittelverordnung) was amended by the incorporation of stricter provisions in 2017, but the EU Commission still did not consider this to be sufficient.

INTELLIGENT SLURRY PROCESSING

NRScompact

„On 25 July 2019, the European Commission decided to open a second round of proceedings against Germany for inadequate implementation of the EC Nitrates Directive. In the worst-case scenario, drastic penalties of a maximum of some EUR 857,000 per day may be imposed for every day that this situation has not been remedied.“

The German Federal Ministry of Food and Agriculture (BMEL) has therefore issued another, new Fertiliser Ordinance, which will pose considerable challenges for farmers from February 2020 and/or from February 2025.

BAN AND APPLICATION METHODS

This new Fertiliser Ordinance contains many details such as distances to bodies of water depending on the slope of the agriculturally-used area, and much more. The extended period in which applying manure is banned and the new requirements for application methods are two of the main issues. With effect from 1 February 2020, i.e. in just a couple of weeks, it will only be permissible to spread slurry and manure onto arable land and green areas in the period from 1 February to 30 September, this extending the banned period in autumn and winter from 4 to 5 months. Storage capacities can be quite tight already, and it is not hard to imagine what the situation may be like from 2020 onwards.

Farmers should either invest in additional storage capacity or accept the cost and time involved in moving manure away („manure tourism“) to farms that want to accept it.

In the meantime, the „disposal costs“ have gone up to EUR 18 per cubic metre. What is especially annoying is that a major share (90 to 97%)



NRScompact

of the slurry that is moved around is simply water. Another sticking point are the new requirements for the application methods. Here the provisions of the new fertiliser regulation will apply to arable land from February 2020 and to grassland from February 2025. Slurry, liquid manure, swill or liquid fermentation residues will have to be deposited directly on the soil using special techniques. This will put an end to the use of popular rear spreaders with baffle plates or swivel nozzles. In addition, the slurry must be worked into the soil within a maximum of four hours. This will also involve additional costs for many farmers. In most cases, investments will have to be made in completely new technology because, for example, old slurry tanks with baffle plate spreaders cannot be retrofitted.

WHAT NOW? WHAT SHOULD YOU DO?

Our suggestion: separation. Separate the slurry into solid and liquid pha-

ses. The solid phase (dry matter >25 %), which is separated from the raw slurry or fermentation residues, is particularly rich in nutrients. It is ideally suited as an energy source in biogas plants or as a natural fertiliser in areas where little farm manure is produced. Further drying and thermal utilisation is also possible. The solid phase can be transported away in order to relieve the burden on the farm's own slurry storage facility.

This makes much more sense now that it is no longer mainly water that is being ferried away.

Another advantage:

Separation optimally prepares the slurry for application using the required methods (hose applicator, drag shoe, slot injection process). Using raw slurry that has not been separated involves the risk of equipment such as hose applicators becoming clogged up. And since non-separated slurry penetrates the soil less effectively, it takes more time to work it into the soil as required. ■

THE UTS FSP B SEPARATOR

ESPECIALLY COST-EFFECTIVE

The FSP B is an ultra-modern, sophisticated filter screw press specifically designed for the agricultural sector.

All technical details of the separator have been designed intelligently and robustly, with an eye to a continuously high throughput and separation performance. Furthermore, the clever construction and high-quality materials minimise wear.

Maintenance and service can be carried out quickly and easily on site without the need to remove the press head and the pipes – minimising downtime. For you, this means low operational costs and high performance during the entire service life of your UTS FSP separator. ■



Separator FSP B-78



Upstream separation before vacuum evaporation



ARE YOU USING BEDDING?

SPECIAL UTS SEPARATORS

What do we mean by bedding?
Bedding refers to the use of straw or bedding straw as litter for animal houses.

Liquid manure can be turned into litter which you can use as bedding for your cows. Although this might sound like something you need to get used to at first, it is actually already widely practised and it has been found to offer many advantages.



UTS has developed special bedding separators of a particularly high capacity and which are a valuable alternative in the context of the current slurry problem. But let's consider the technology first, before we go into the economic returns.

The UTS bedding separators feature an extremely robust screw that presses slurry through a screen. Clever technology has enabled us to produce an extremely high pressure at the screen, thus achieving a dry matter content of 35 to 40% (!) which is actually quite exceptional in the current market. This means that the separated slurry has become something different from liquid manure. The solid substance that is obtained actually smells like peat and has a pleasant consistency with low residual moisture. This makes it a fine bedding material with good lying properties.

ARE THERE ANY ECONOMIC ADVANTAGES?

Yes, for example, bedding materials such as straw and sawdust no longer have to be purchased at high prices. The annual costs of sawdust as bedding for the cow boxes for a farm with some 100 dairy cows can be as much as EUR 20,000. A quote from a farmer who has experience of bedding: „Not only does bedding litter cost less than sawdust, it is also more sustainable since it enables us to make optimum use of our own slurry“. And the new litter offers significantly better lying comfort, something which contributes to improved udder health.

An advantage of bedding that must not be underestimated is that it significantly reduces ankle and carpal joint injuries and this has enabled farms that apply bedding to reduce their mortality rates to max. 20%. Furthermore, you can also benefit from the easier application of the liquid phase and the increased storage capacity in the manure storage facility. A UTS bedding separator is already worthwhile for a dairy herd of 80 cows and it takes only a short time to earn back the investment! ■

MOBILE SEPARATORS

THE MOBILE UTS SEPARATOR RANGE IS CALLED MSU.

The system can be used wherever it is needed.

No permit or approval is required for its temporary use. The MSU separator is especially interesting if the slurry needs to be separated in several different locations on a farm or if neighbouring farms share a solution.

The different designs enable these separators to be used in regular separation mode, in bedding mode, or in combined mode which enables the

separator to be switched over between these two versions. In the end, we do not deliver just any product to you, but exactly the separator solution that you need and that is profitable for you. We would be happy to advise you and prepare a mass, nutrient, and cost balance free of charge. We can also support you in integrating the separation system into your processes.

And if you wish, we can take over the complete separator installation for you, including pumps, platform,

pipings, fittings, sensors and control system. Even though the new Fertiliser Ordinance has not made your life and business operations any easier, there are technical solutions that can help you to optimally deal with these challenges. The possibilities range from separation to biogas plants.

We would be happy to show you what is possible for you now and to do the sums together with you in order to calculate what would be profitable for both you and your company. ■



MSU 1-78



UTS SERVICE

MR. BIOGAS MICHAEL FRITZ



Anyone operating a UTS biogas plant in the north or north-east of Germany, in postcode area 1 from Rostock to Potsdam, should know Michael Fritz. If you are planning such a plant, it would be a good idea and very worthwhile to have him by your side. When it comes to service, maintenance, or repowering a biogas plant or constructing a new one, this independent UTS service and trading partner is our specialist and the face of UTS on site. Michael Fritz is a qualified electrician who started his professional career in the 1980s by selling and installing technical installations for animal houses. Through further training, he not only gradually got to know UTS technology, but he also learned to appreciate it.

ALWAYS OUTDOORS

Having started his career in the agricultural sector, he has remained in this sector ever since. This is because he not only enjoys technology, but he also loves being out in the fresh air every day, even if it brings intense country odours at times. In 2001, Michael Fritz started his own company Handelsvertretung & Montageservice Michael Fritz and he has been self-employed since then. While working on site at farms in his local region, he found that his customers were increasingly calling on him for service and maintenance work on UTS pumps and mixers. His contacts with UTS became ever closer, the cooperation went smoothly and so Michael Fritz became an official UTS service and trading partner in 2001.







Michael Fritz at the MeLa agricultural fair in Mühlenteez

INVOLVED FROM THE START

MICHAEL FRITZ

One could say that, as regards biogas plants, Michael Fritz has been involved from the start and has experienced their initial development and further development hands on.

A real pioneer, he has become an experienced and popular specialist who is the number one contact for his customers for all technical matters.

„I take care of service, repairs and maintenance of the equipment. I discuss modifications and spare part deliveries with my customers, and provide them with detailed quotations, stating concrete prices. I'm available to my customers 24 hours a day, every day of the week.“

During his almost twenty years as a self-employed professional, Michael

Fritz has developed from being purely a technician into a biogas plant specialist. Based on his comprehensive experience and broad knowledge, he advises customers on matters that go beyond technical service, supporting them with optimisations in particular.

„My customers place a lot of trust in me. Restructuring and modernising existing biogas plants is a special task they entrust to me. This requires detailed knowledge and skilled craftsmanship. I enjoy learning new things in such projects and working closely with my customers.“

GOOD, CLOSE COOPERATION

He not only values UTS' good technical products, but he particularly appreciates the team spirit and close, respectful cooperation with UTS. „If there are any technical questions to be answered or quotations to be prepared, UTS colleagues are there to support me. Everything goes quickly and smoothly. All in all, UTS enables me to optimally serve my customers and ensure the best possible utilisation of the biogas plants. This is the basis for customer satisfaction.“

With demand for clean, ecological energy constantly growing, Michael Fritz is optimistic about the future of the biogas plant industry. He is happy to take on the challenges of further technical development, especially with regard to new, more efficient plant components, and to continue to expand his technical knowledge.

He has one wish for his personal future: „I would like to have one or two capable young employees with whom I can share my professional know-how until I retire. That would give my company a future and my customers would continue to receive excellent service.“ This is something that UTS wishes as well.

We believe in the saying

Never change a winning team. ■



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MORE BIOPOWER FOR DEMMIN

DEMMIN UTS BIOGAS PLANT PROJECT



The Hanseatic town of Demmin with its approximately 11,000 inhabitants* lies in glorious Mecklenburg-Vorpommern on the edge of the largest administrative district of Germany (twice the size of the Saarland) which is known as the Mecklenburgische Seenplatte (Mecklenburg Lake District).

From a bird's eye view, the landscape is mainly green and blue – characterised by forests, lakes, river landscapes, meadows and farmers' fields. With so much space being available, it makes sense to generate energy from biomass and thus become less dependent on oil and gas.

HAND IN HAND

In 2005, the municipality decided to take parts of the municipal energy supply into its own hands. The plan was to construct a biogas plant to operate a combined heat and power unit to generate district heating and electricity.

A feasibility study led to the go-

ahead and a partner that would build and operate the biogas plant was quickly found in the agricultural enterprise Kirchengut Demmin Klocke GbR. After intensive planning and design, and extensive construction work, the plant was put into operation in early 2007.

From then onwards, the biogas plant on the outskirts of the city has been supplying biogas to the Saarstraße heating plant via a 400 m long gas pipeline. Here, a combined heat and power unit generates renewable electricity which is fed into the grid. The heat produced in this unit and the heat from the biogas plant is fed into the municipal district heating network.

Karsten Behrens, authorized representative of the municipal utility company explains: „800 houses benefit from the combined heat and power unit (CHP) which also heats a vocational school, a boarding school, a grammar school, the Friesenhalle, and the Pestalozzi school. By utilising the heat, the municipal utilities spend less on fossil fuels.“

MILLIONS OF KILOWATT HOURS EVERY YEAR

The two fermenters of the biogas plant at Kirchgut use more than 10,000 metric tons of biomass a year for biogas production: approx. 9,000 tons of maize, approx. 900 tons of grains, and up to 1,000 m³ of slurry (to start the plant or to ensure the biological stability of the plant). The total biogas production is 2.8 million m³. The total amount of energy generated in the biogas plant and the CHP unit adds up to around five million kWh of electricity and four million kWh of heat. This saves 6,000 metric tons of CO₂ a year.

FLEXIBILIZATION WITH UTS

This year, after our UTS partner Michael Fritz had been doing the maintenance and repair work on the biogas plant for several years, we were commissioned to make the plant more flexible. The aim was to increase plant efficiency and to be able to tailor the electricity production more flexibly to price fluctuations in the electricity market. A gas storage



tank enables us to only run the generator of the CHP when electricity prices are high and when a (very) good profitability can be achieved.

Another important point is minimising the plant's power consumption, thus further increasing the overall efficiency and profitability. To achieve this, the existing conventional hydraulic units were replaced by modern hydraulic drive units (TRG-H-WLS 400) and combined with four performance-optimised 3D mixer blades in the fermenters. An old electrical mixer in the mixing pit was replaced by a highly efficient and powerful UTS PSM submersible mixer (TRG-E-PSM 940).

In addition to significantly lowering electricity consumption, the flexibility measures have significantly increased gas yield and reduced noise emissions. In the end, this benefits all the partners in this showcase project and the citizens of Demmin, who now have even more sustainably generated energy in the form of renewable electricity and district heating at their disposal. ■



Andreas Gierke (plant operator Demmin), Olaf Schmetzke (Managing director of municipal utilities in Demmin) and Michael Fritz (from left to right)

COMPARISON OF EFFICIENCY AND COSTS FOR THE REPOWERING OF BIOGAS PLANT DEMMIN

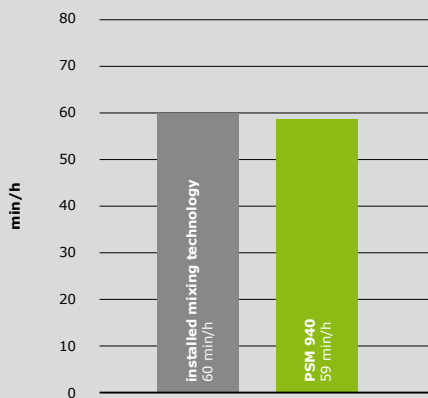
PSM MIXER - ENERGY CONSUMPTION

Energy savings when using UTS PSM technology compared to conventional electric mixing technology

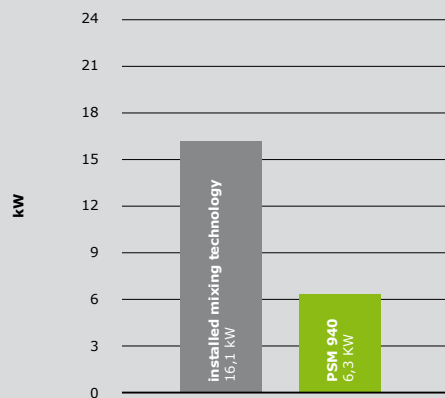


Tank: Mashing pit Tank size: 125 m³ Electricity price: 0,19 €/kWh

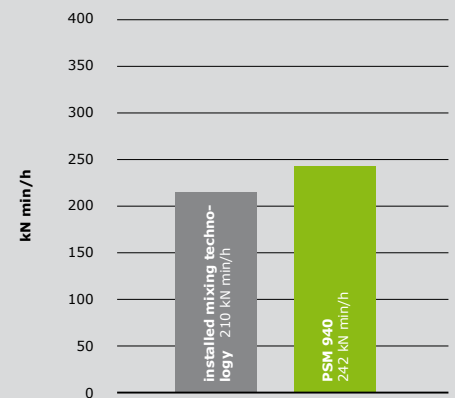
Mixing Time



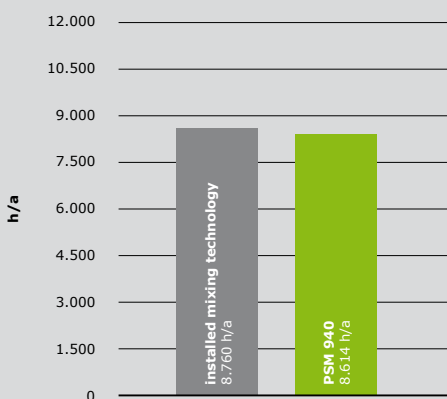
Nominal power



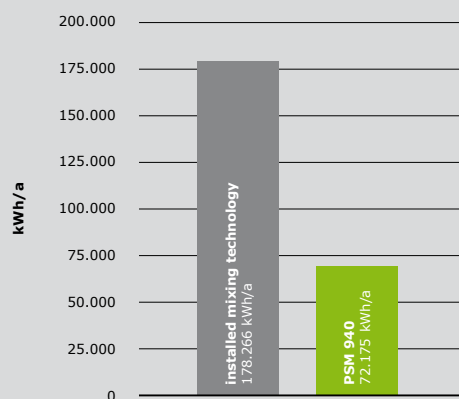
Thrust-Time Factor



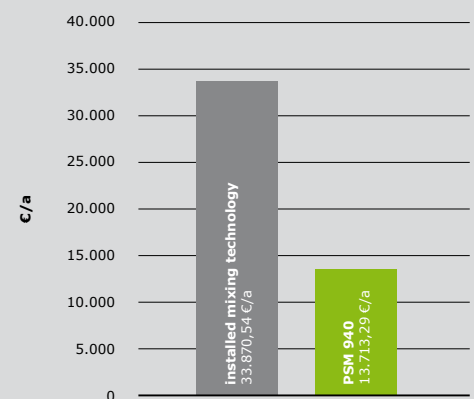
Yearly Mixing Time



Yearly Energy Consumption



Yearly Electricity Costs



178.266 kWh/a - 72.175 kWh/a
= 106.091 kWh/a

60%

Yearly Energy Savings

33.870,54 €/a - 13.713,29 €/a
= 20.157,25 €/a

60%

Yearly Savings Electricity Costs

UTS TECHNOLOGY UPGRADE FOR EVERY BIOGAS PLANT

PSM MIXER TECHNOLOGY

UTS has completely built or repowered hundreds of biogas plants in Germany and around the world and equipped them with high-quality components made by UTS.



However, as the example of Demmin shows, we can also equip any other plant with UTS technology to make it more efficient.

Our highly efficient mixing technology, our powerful separators and our long-lasting pumps can be integrated into almost any biogas plant. Also, our service box with integrated mixing control unit and over-/under pressure protection should not be missing in any new air-bearing roof. Just ask one of our many long-term customers.

The best example is our PSM submersible mixer, which is only available from UTS. It can be integrated into any round container without major efforts and brings you additional stirring power at half the energy consumption.

All without additional holes in the concrete wall or new floor shots. Your own power consumption will be significantly reduced thanks to DMC control and gearless PSM drive – we promise! And if that is not enough, we are happy to offer you a before-and-after recording at any time and let us show you that we keep our promises.

We also recorded and calculated the mixing technology at the Demmin plant together with our customer. Just take a look at the figures...

More and more renowned service companies are already relying on our technology, such as MT Energy from Zeven. The service and repowering specialist from Lower Saxony has already equipped several systems with UTS PSM mixers this year and has made its customers very happy.

Just ask your service partner about mixing technology from UTS or contact us directly if they try to sell you something else. ■



PSM-940



PSM-1500

ADDED BENEFITS!

UTS SERVICE-BOX PRO





First generation of service-box in operation for over 20 years

The only really good biogas plant is one that runs smoothly. If there are any problems, then it is no fun being a biogas plant operator, nor will the best possible economic efficiency be achieved. At UTS, we are always thinking about further optimizations. Ways to make things a little bit better.

Our advantage: we have field personnel and engineers working hand in hand with each other. Our service technicians work in the field and their experience has taught them what works and what doesn't work, as well as what makes sense and what doesn't. And our design engineers then develop exactly the technology that is needed to make biogas plants even better, more efficient, more comfortable and more profitable.

STIRRED, NOT SHAKEN

The key aspect of a biogas plant is the gas yield. Only perfectly controlled plant biology with an optimum fermentation process can ensure maximum yields. This is not possible without mixer equipment that is 100% reliable and that works optimally all the time. The enormous blades (preferably from UTS) pull through powerfully and keep stirring and mixing, unrelentingly. But as is the case with all equipment that is used intensively,

like your tractors and agricultural equipment, continuity and reliability are not possible without service and maintenance. This is a sensitive issue, as no one likes to interfere in a process that is running smoothly.

We have therefore looked into how these activities can be carried out as simply as possible and without any major interventions in the processes. And of course, we have also looked at how any loss of methane can be carefully managed while carrying out maintenance work on the mixer. Our solution, and one that is subject to continuous development, is the UTS Service Box. Its latest version is the UTS Service Box Pro.

PATENTED SYSTEM

The UTS Service-Box Pro is a TÜV certified and patented closed system packed with ideas and clever detailed solutions. First of all, it can be combined with all kinds of tanks and roofs, e.g. with tent roofs, air-supported roofs up to ¼ spheres, and also concrete roofs. In order to achieve maximum gas storage capacity, the UTS Service Box Pro is integrated perfectly into the membrane roof and without any kinks or folds in the membrane. And since the box works with various brands of mixer, it offers maximum flexibility of use.

The UTS Service-Box Pro is a robust stainless-steel construction which also offers an optional membrane clamping frame that allows gas-tight installation. The operating, working and control platform features two maintenance openings for major and minor maintenance work. The Pro version has a larger maintenance opening, enabling mixers with a diameter up to 1500 mm to be installed and removed.

An adjustment unit enables easy lifting, swivelling of the mixer level. During maintenance, the entire mixer equipment is lifted out of the fermenter so that any work can be carried out comfortably, fast and safely. Since there is no need to open the membrane roof or lower the tank, the biological process can continue uninterrupted. Maintenance can be carried out fast and smoothly, without little loss of gas.

This protects the environment and increases the economic efficiency of the plant. The slanted inspection window, recessed into one of the maintenance openings to check the surface of the fermenter, is also a very practical feature.

In addition to a cable or hose entry for the mixer, the UTS Service Box Pro also includes connections for measuring sensors such as gas pressure sensors.



PRESSURE SAFETY AND GAS OUTLET

The UTS Service-Box Pro is a modular system and offers two further important functions. The gas outlet integrated into the Service-Box connects the fermenter to the gas lines. No further gas outlet through the wall or ceiling is required. The system also protects the tank against overpressure and underpressure by means of frost-proof pressure safety devices. The robust valves react to underpressure from max. $-1,3$ mbar (-130 Pa) and to overpressure in the range of 1 to 5 mbar (100 - 500 Pa). Any pressure peaks are reliably absorbed, in the event of overpressure simply by means of a vent stack at the top of the service box.

Due to the increased arrangement of the gas outlet and the pressure fuses, a flow or block by substrate is prevented constructively by substrate.

MANY ADVANTAGES, USEFUL OPTIONS

If you want to achieve optimum mixer maintenance, gas extraction and tank safety, you should definitely take a closer look at the UTS Service-Box Pro. It will be worth your while! The carefully devised, TÜV-certified system offers several advantages that pay off immediately and allow plant operators to sleep better. The total system with its coordinated, high-quality components minimizes methane emissions, increases operating times and gas yields, simplifies maintenance work, and shortens maintenance times. In addition, the UTS Service-Box Pro can be planned and installed quickly and easily.

The following components are optional extras: mounting frames and adapter frames for installation or installation of concrete ceilings, adapter plates for connecting the gas line, a motorised height adjustment, a short working platform



for connecting gangways on site, and a long working platform for attaching an access ladder.

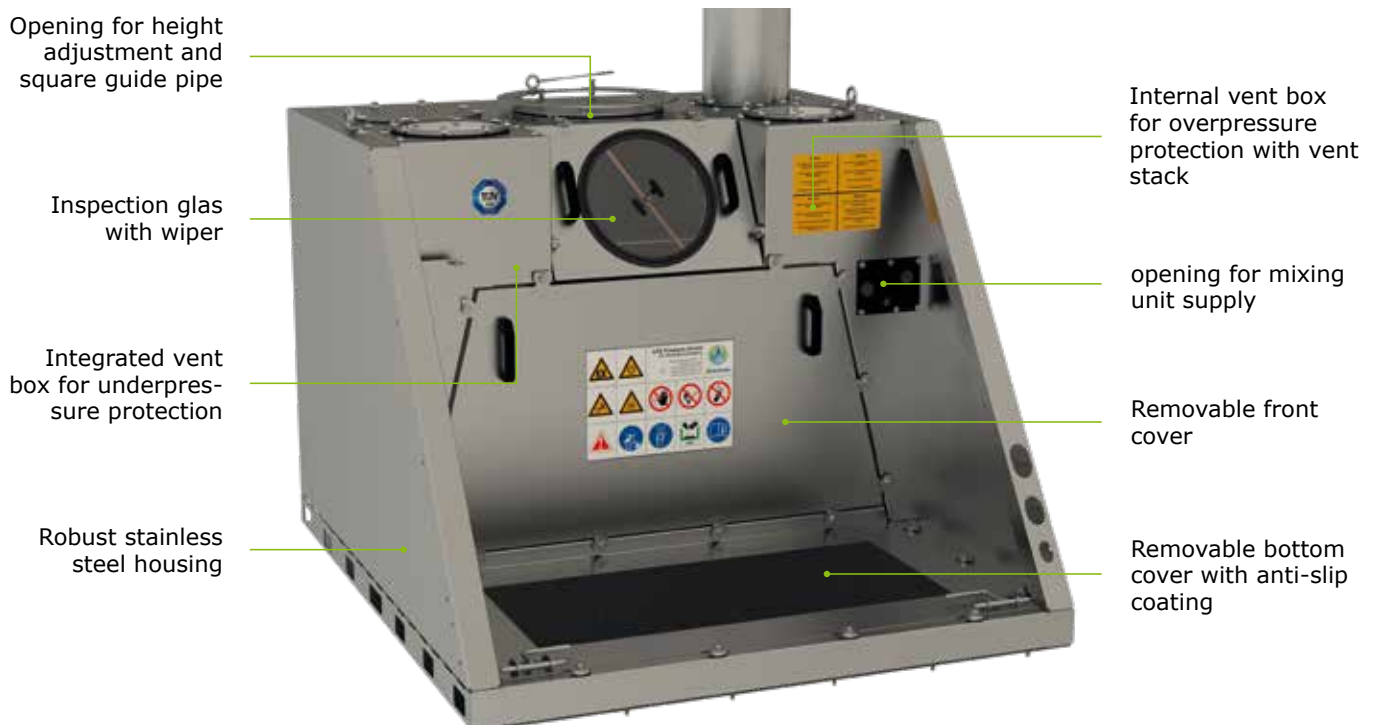
Interesting? Curious? Do you have any further questions or are you already convinced? We would be happy to take a look at

your system and show you what the tried and tested, patented UTS Service-Box Pro can do for you.

Even if you are not using any UTS mixers at the moment. Which would be a shame, of course, but that does not mean that we cannot

start working together now.

So please call us and let's talk to each other. About the possibilities, economic efficiency, plant comfort, and all those things that make life easier for you as a plant operator. ■







ANAERGIA PROJEKT ANAEROBIC DIGESTION FACILITY IN CARDIFF, UK

TOWARDS ZERO WASTE

Wales, situated in the west of Great Britain and bordered by the Irish Sea, is a beautiful green spot. Spacious meadows, hills, moors and mountains characterise the country. Large areas of Wales are protected landscape areas. And since the Welsh people feel closely connected to their country and its nature, it will come as no surprise that Wales was an early adopter of ambitious environmental goals: the country aspires to achieve zero waste by 2050. This means that its recycling rate will have to be increased to 70% by 2025. The fact that Wales is taking its zero waste strategy seriously is demonstrated by the fact that, although the country's current landfill capacity will be exhausted in a few years' time, the country is not allowing any new landfill sites to be created in the future. So there is no time to waste!



AN ANAERGIA PROJECT

DIGESTION FACILITY IN
CARDIFF, UK

RECYCLING FOOD WASTE

An important pillar on the way to greater sustainability and better environmental protection is the use and processing of food waste which is full of energy that can be used sustainably. If food waste is left to decompose on a landfill site, this energy is dissipated into the open air as methane gas that harms the environment. To avoid this, the City of Cardiff decided in 2012 that food waste should be collected from local residents and businesses in the City and in the surrounding county of Vale of Glamorgan to be used to produce biogas, green electricity, and organic fertiliser.

In April 2015, Anaergia was commissioned by Kelda Organic Energy Ltd, a subsidiary of the Kelda Group, to build a biogas plant with waste processing facilities on the site of Welsh Water's Cardiff Wastewater Treatment Works in Tremorfa (Cardiff, Wales).

The plant now owned by Welsh Water Organic Energy can process up to 35,000 tons of food waste every year: kerbside food waste with <7% non-organic contamination and commercial food waste with <10% non-organic contamination. The food waste is prepared by removing all non-food contamination before it is processed in two fermentation tanks to produce biogas. The biogas is used to operate a combined heat and power (CHP) which produces 2 MW_{ele} and 2 MW_{th} supplying clean electricity and heat to the plant and excess electri-





city to the neighbouring wastewater treatment works or the public grid. The heat is used to heat the digesters and pasteurise the digestate on site. In addition, the process produces 1,886 tons of solid digestate for compost production (20-25% dry matter) and 37,611 tons of liquid digestate for crop production (3-4% of dry matter) a year. These are impressive figures, showing what state-of-the-art waste processing technology is capable of.

POWERFUL TECHNOLOGIES

Optimised pre-treatment of the food waste used is decisive for the efficiency of the overall facility and for the quality of the biogas and solid and liquid fertilisers produced. To achieve this, Anaergia combines two highly powerful systems at its Cardiff facilities. The first step consists of using a db-Bag Opener from our Dutch subsidiary db to tear open the waste bags delivered to the plant waste and then prepare the waste for further processing.

Next, an Anaergia BioREX 300 high-pressure extrusion press reliably separates the waste into organic and inorganic components. Water is added to this to create a pumpable fermentation substrate that has been optimised for the fermentation process and that contains less than 3% inorganic substances. The share of organic substances in the separated inorganic fraction is less than 5%.

Anaergia has implemented leading biogas technology from its German subsidiary UTS in the fermenters. This ensures a maximum biogas yield with minimum energy consumption. PSM submersible mixers with intelligent motor control (DMC), a high torque (up to 800 Nm), and carefully developed mixer blade geometry ensure the best possible flows with gentle metabolism/gas exchange for the bacteria and uniform through and through mixing of the entire fermenter contents. The mixing process is optimised and the hydraulic retention time (HRT) is extended. UTS service boxes enable service and maintenance of the mixing technology without opening the roof and thus without any methane escaping. The biogas produced is treated using biological desulphurisation and is then dried before being used in the CHP to produce clean electricity and heat. The digestion process ends with pasteurisation and a high-end UTS filter screw press (FSP) separating the fermentation residues or digestate into solid and liquid fractions. The liquid fraction meets the stringent British Standards Institution (BSI) Publicly Available Specifications (PAS) 110 standard which allows for less regulated use of the organic fertiliser.

MANY ADVANTAGES

The facility in Cardiff is an excellent example of how modern waste management can work intelligent-

ly. There is less burden on landfills and the environment and climate are protected. The environmental balance and benefits for the City of Cardiff and the surrounding area are enormous. Less methane is released whilst at the same time generating biogas for the production of clean electricity. In addition, valuable fertiliser is produced for agriculture, reducing the need for the energy-intensive production of artificial fertiliser. These are two factors that significantly reduce CO₂ emissions. All in all, this facility is an important step towards achieving the ambitious sustainability goals that Cardiff and Wales have set.

Councillor Bob Derbyshire, City of Cardiff council cabinet member for environment: "The signing of the contract with Kelda signifies a new 15-year partnership between Kelda, the City of Cardiff council, and the Vale of Glamorgan council to deliver innovative ways to treat organic waste. This contract is a reinforcement of our commitment to meet the statutory Welsh Government targets as we work towards their 'Zero Waste' goal for 2050." As part of this partnership, Anaergia designed and built the plant in Cardiff using its know-how and leading technologies. We are very pleased that our work has contributed to greater sustainability and has brought Wales closer to achieving its Zero Waste goal. Sometimes zero is the best you can achieve. ■



Anaergia

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