



Why our energy has so many advantages.  
Not only for our customers.



++ The advantages of biogas are many and varied. As a plant operator, you are assured of a calculable source of income from generating a power supply that is not dependent on the weather and that is not subject to price fluctuations. At the same time, you are making an active contribution to protecting the environment and to the energy mix of the future with a biogas plant.



### + Climate-friendly energy

Biogas is a natural degradation product which is produced when organic matter ferments. Energy generation from biogas is especially environmentally-friendly as it does not cause any additional greenhouse gas CO<sub>2</sub> emissions. This way, biogas represents an important contribution to achieving climate protection goals.

### + Security for the farmer and for the next generation

Through the production of biogas, farmers are assured of a reliable source of income and thus also ensure that their farm can pass to the next generation. Power generated from biogas is not subject to any price fluctuations and therefore offers long-term prospects and a calculable source of income.

### + Cost-effective for industry

Biogas plants are all rounders. The substrate is made up not only of agricultural plant material (renewable raw materials), but also manure and organic materials from the food processing and agricultural industries. Companies that accrue biological residual materials in production can use the power they generate (electricity, heat, biogas) at their own site, thereby taking advantage of a closed cycle.

### + Energy available at all times

Different from wind and sun power, biogas generation is not dependent on climatic factors. This means biogas is a reliable provider of energy at any time. Biogas can also be stored and converted to energy at any time. As a power source, it can meet both base-load and peak-load requirements.

### + No risk, no smell

If a biogas plant is operated properly, there are no odour nuisances, or any kind of risk to local residents as the gas that is produced from the closed system cannot escape. The fully fermented final product has a noticeably reduced odour after the fermentation process.

### + No monocultures

All types of agricultural raw and residual materials can be used in our biogas plants. This affords farmers a healthy crop rotation and helps them prevent monocultures.

### + The diversity of renewable energy

Whether as a source of electricity, to generate heat locally, to supply heat by pipeline or to feed into the gas network after processing, the applications for biogas are manifold. No other renewable energy source is as versatile.



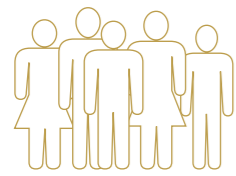
# Because biogas is more worthwhile than you think. Even for the environment.



- + Biogas makes an active contribution to climate protection
- + Biogas offers a reliable source of income
- + Plant operators can adapt flexibly to input materials
- + Biogas generation is independent of weather conditions
- + Biogas is storable
- + Biogas as a power supply can be used in many different ways



++ As a company EnviTec Biogas is constantly growing. This is because more and more politicians, farmers and investors are recognising the benefits of biogas. But also because potential plant operators and energy providers prefer to have an experienced partner.



### + Long-term experience

EnviTec Biogas was founded in 2002. Prior to this, the company founders, as well as many employees, had gained years of experience in plant construction in the industry. The company has built its success upon this wealth of experience and since 2007 has been listed on the Frankfurt stock exchange.

### + International focus

Throughout the world a growing number of governments are recognising the advantages of biogas as a renewable source of energy, which can be part of a de-centralised supply network, and are creating attractive conditions for production. Getting an early foothold in these countries is a main objective of our growth strategy. Whether in Europe, Asia or the USA – our technology is in demand internationally. We are already active in more than 15 countries.

### + Everything from one source

We cover the entire value-added chain for the production of biogas. This includes the planning, the turnkey construction and the commissioning of biogas plants. After completing your project, you continue to receive support from our service team. This ensures that your plant is continuously operated at maximum efficiency. And we will also work with you to develop the best possible concept for marketing your energy.

### + Top installed output

Throughout the world we enjoy a high level of trust from our customers. Measured by the installed output, we are the market leader. Our excellent success is owed not only to our expertise and experience but also primarily to our constant technological development work. EnviTec plants reflect state-of-the-art technology. We set the benchmark for the industry with our know-how.

### + High quality standard



Quality has a top priority at EnviTec Biogas. In order to guarantee a high standard of quality, we only work with selected suppliers who share our understanding of quality. We have developed and maintained longstanding business relations with these reliable partners. For us, "Made in Germany" means maintaining the highest quality standards. These standards are reflected in our internationally recognised certifications. We have successfully implemented our quality management system in compliance with DIN EN ISO 2001-2008 at EnviTec Biogas AG, at some of our German subsidiaries and also at our branches in Italy and the Czech Republic.

### + Maximum safety

CE EnviTec is one of the few suppliers that only puts biogas plants with a CE Marking into operation. The CE Marking clearly shows our high quality and safety standards. Our plants comply with all EU health and safety legislation and meet all TUV certification requirements.



Because as one of the most experienced providers, we offer maximum safety. For both customers and employees.



← The farmer and entrepreneur Ulrich Wessel-Ellermann was one of the first customers who setup a small gas grid in his village and thus made a prime example of decentralised energy supply.

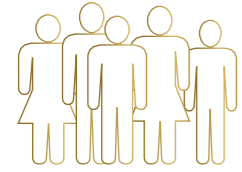
→ Our service staff is one of the key elements to help customers like Wessel-Ellermann in order to keep their biogas plants efficient.



- + Many years' experience in plant construction
- + Full service during and after construction
- + Technology pioneer in the industry
- + Quality standards comply with ISO norms



++ We ensure optimum operational procedures – from the very beginning and at all times, whether for compact systems for farms or for industrial-scale plants. And we continue to give you support even after construction.



### + Concept development

Special local conditions, available input materials, different legal requirements or different biogas usage possibilities – no two plants are identical. We develop a customised concept for your project according to your requirements which accounts for the respective conditions.

### + Plant construction

Thanks to the modular plant construction from series-produced individual components, we are able to respond flexibly to customer requirements and to implement these quickly. An experienced assembly team ensures the smooth construction of your biogas plant. The well-established team of project and building supervisors are always available for you during the entire construction phase.

### + Commissioning

To ensure everything runs correctly from the beginning, our specialists start up the plant for you. In addition to supplying exact instructions, our customer service also includes training your employees on your plant.

### + Service

We provide you weekly with information on the capacity utilisation of your plant. Our experts from our biological service will provide you with individual feed proposals in order to increase efficiency as required. In case of need, you can contact our technical service 24 hours a day. EnviTec's delivery times for spare parts are kept short. The majority of components are permanently in stock.

### + Participation concepts

In addition to constructing biogas plants for customers, EnviTec also operates its own biogas plants. In doing so, we welcome cooperation with partners from agriculture and industry. The goal is the successful joint operation of a plant. We will be delighted to draw up a concept with you on the basis of the specific aspects of the location for a possible participation and cooperation model.



# Because we value the challenges of both large and small projects. Before, during and after construction.



← After the plant has been built, it is monitored continuously and optimised if needed, to ensure maximum efficiency.

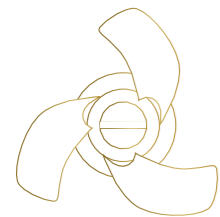
→ In Güstrow, in Eastern Germany, we have built the world's largest plant for biogas production to natural gas quality.



- + The development of concepts for applications ranging from compact systems for farms to industrial-scale plants
- + Biogas plants with modular design
- + Extensive service and guaranteed maximum efficiency for your plant
- + Attractive investment concepts
- + Energy marketing



++ For years, we have achieved pioneering work in plant optimisation to permanently improve the economic efficiency of biogas plants. In the process, we have developed many forward-looking processes to increase biogas production. It was all worth the effort: As the technological leader in the industry, we can offer numerous additional techniques that allow you to increase the value creation of your plant even more.



### + EnviThan biogas upgrading

In order to create biomethane with natural gas quality, the biogas must be cleaned. For this, state-of-the-art hollow fibre membranes are used in the modern EnviThan gas upgrading plants. The membrane technology is considerably more environmentally friendly, flexible and energy- and cost-efficient than other biogas upgrading technologies. The innovative method exploits the different sizes of gas molecules and increases the amount of high-energy methane from approximately 50% to up to more than 97 Vol %.

### + Kreis-Dissolver

Every component has an effect on the efficiency of a biogas plant. EnviTec customers can achieve significant advances in their plants with the so-called "Kreis-Dissolver" in comparison to standard cutters. This optimum conditioning of the feedstocks increases the gas yield considerably.

As the content in the digester is less viscous due to more thorough cutting, as an operator you also save energy in operating the agitators.

### + EnviTec Feedcontrol



The consistent production of biogas depends on the strict precise timing of feeding the bacteria in the digester. Our award-winning "Machine of the Year 2010" control system, the EnviTec Feedcontrol, adjusts the feed intervals automatically so that biogas production remains at a constantly high level.

### + ORC technology and waste heat recovery

A considerable amount of the heat generated in the operation of biogas plants is discharged unused along with the exhaust gas. ORC technology increases the efficiency of a biogas plant by generating additional electricity from the exhaust gas. This electricity is then fed into the public grid along with the electricity produced by the biogas plant.

### + External desulphurisation

To protect the motor in the combined heat and power unit (CHP), we have developed an external desulphurisation installation, which significantly reduces the amount of hydrogen sulphide in the biogas produced. Through a biological procedure, the installation achieves a cleaning performance in desulphurisation of more than 90 percent on average.

Because we are rewarded again and again for optimising our technologies. With the most efficient plants on the market.



← State-of-the-art hollow fibre membranes are used in EnviThan gas upgrading plants.

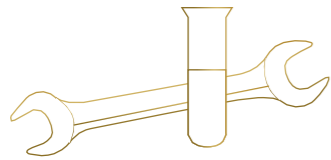
→ The Kreis-Dissolver ensures higher gas production through optimum cutting of feedstocks.



- + Biogas treatment for new sales markets
- + Kreis-Dissolver for greater gas yields
- + Award-winning: EnviTec Feedcontrol for consistent production
- + Desulphurisation installation to protect the CHP
- + ORC technology for generating additional electricity from exhaust gas from plants



++ Put it up quick and leave – this is not our motto. We are there to help in matters relating to the daily operation of your plant. We pride ourselves on the high efficiency and reliability of our biogas plants. So that they stay that way, our service people are always ready to help.



### + Hotline



Twenty-four hours a day service. For technical assistance and fault reports our hotline is open seven days a week, 24 hours a day. If necessary, experienced technicians are on call to correct faults on site and will arrange for the fastest possible delivery of spare parts.

### + Technical service

Regular maintenance work increases the technical availability of your plant and thus reduces any downtime. Our goal is for your biogas plant to run smoothly and profitably. At the customer's choice, we offer our services according to cost or by way of maintenance contracts. In over 90% of all cases, we can repair the damage within 24 hours.

### + Spare parts supply

Thanks to our local storage sites close to customers, for the most part delivery times for spare and wearing parts are short. For example, in Germany an additional 18 service vehicles are in use, which always carry the main individual components. This means that we can reach you quickly when required and help you avoid downtime.

### + Biological service

From the start up of your plant, our specialists will support you with any questions regarding the biological process or in assessing the quality of your feedstock. If desired, you can even benefit in future operations from our long-term experience on site or by online monitoring. We will regularly examine your feedstock in the laboratory and current fermenting samples. If necessary, we will make recommendations on how you can increase the performance capability of your plant.

### + Service products

With our auxiliary materials (trace element mixtures), we can raise the performance level of your plant even higher. The formula of our product EnVital is specially adapted to the requirements of your digester. Our ferrous compound, EnviRed, in turn binds the sulphur already present in the digester, thereby reducing the development of the harmful gas, hydrogen sulphide (H<sub>2</sub>S), in the biogas. The high quality of the biogas lengthens the service life of the motor oil and the activated carbon filters.

### + EnviTec web interface

If desired, you can check the cost-effectiveness of your plant at any time at our web interface. Your plant's data is automatically protected via the online connection. Of particular use is the anonymous comparison of your plant's capacity and gas productivity with other plants from EnviTec.



Because we have learned that the best technology can do even more when coupled with good service. That's our motivation.

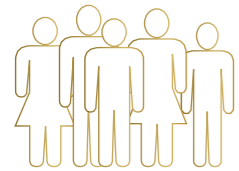
→ Our specialists take care of your new plant at the start and, if desired, during future operations.



- + Technical hotline 24 hours a day
- + Technical maintenance of your plant
- + Wearing and spare parts supply
- + Constant check of the biological process
- + Recommendations on increasing production
- + Biogas web interface with productivity information



++ Worldwide, customers rely on us since our concepts can easily adapted to meet local requirements and our plants are able to produce clean energy from various sources like organic waste, manure, slurry and renewable input materials.



### + Energy from food waste at Premier Foods in Wales

**LOCATION** Rogerstone/Wales  
**CAPACITY** 499 kW<sub>el</sub>  
**IN OPERATION SINCE** 03/2011  
**INPUT MATERIALS** Food waste  
**FEATURES** The ready-meals factory derives its energy supply from food waste.

The plant is located next to the Rogerstone Park ready-meals factory of RF Brookes, a subsidiary of food company Premier Foods. Its purpose is to generate energy from the food waste produced by the company. The biogas plant supplies about 10 percent of the electricity required for food production in the factory. In the process, the biogas plant contributes to an annual CO<sub>2</sub> savings of approximately 8,500 tonnes. In addition, the former costs for disposal of the waste have been eliminated.

### + Cooperation of agriculture and industry in France

**LOCATION** Rohan/France  
**CAPACITY** 526 kW<sub>el</sub>  
**IN OPERATION SINCE** 09/2010  
**INPUT MATERIALS** Pig liquid manure, flotate fat, maize silage  
**FEATURES** Flotate fats and oils from the food industry supply approximately 75% of the energy produced.

The electricity generated in the biogas plant in Rohan is sold in its entirety to the energy company EDF. The generated heat is used by the agricultural firm Le Crom itself in order to heat the digester of the biogas plant. In addition, the company uses the exhaust heat to dry fermentation residues and to heat the flotate fats and oils from the food industry. Flotate fats and oils account for 75% and thus the majority of the energy produced at the plant, which is also generated from manure and maize silage. The agricultural firm has established long-term contracts with farming and industrial companies from the region, who supply much of the waste materials.

### + The Mucchiut farm in Italy: Energy from agricultural resources

**LOCATION** 33040 Corno di Rosazzo (UD)  
**CAPACITY** 330 kW<sub>el</sub>  
**IN OPERATION SINCE** 08/2011  
**INPUT MATERIALS** Biomass of agricultural origin (maize, triticale, sorghum), chicken dung, pig slurry  
**FEATURES** Fully integrated biogas plant. Complete use of farming sub-products (chicken dung) as input material.

The Mucchiut farm is a solid example of integration and differentiation in farm production, from renewable source electricity to traditional production in a classic agricultural context. Traditional agricultural production, representing the core of the Mucchiut Farm, is in poultry raising, with a covered area of 5000 m<sup>2</sup>. In a year, the biogas plant uses approximately 5800 tons of maize, 2,000 tons of pig slurry and approximately 1800 tons of water which are mixed with 800 – 1000 tons of chicken dung from the farm itself. By using chicken dung in the biogas plant, this input material is transformed from a cost factor into a resource.

➔ Because it is ultimately our customers who are also important to the success of a project. And this for both sides.



← In Wales, the food factory Rogerstone Park uses a biogas plant to supply itself with energy.

→ In Rohan, France, industrial partners supply waste such as fats.

→→ The Mucchiut farm in Italy is a solid example of integration and differentiation in farm production.





# Because big decisions don't allow for any compromises.



## The technology at a glance

### + Flexo roof

The self-supporting, gas-tight, extremely strong and long-lasting roof ensures stable process conditions. Agitator maintenance is possible at any time during operations through the outlet opening.

### + External desulphurisation

Our external desulphurisation plant protects the motor in the co-generation plant. It considerably reduces the amount of hydrogen sulphide contained in the biogas generated.

### + Modular construction

Our standard construction elements ensure short construction times, top quality and maximum ease of maintenance of your biogas plant.

### + EnviThan biogas upgrading

With our biogas upgrading technology, the methane content in the biogas can be increased from an average 55 to at least 97 volume percent. Plant operators can store the upgraded gas in the public gas network.

### + EnviTec Feedcontrol

Our "Machine of the Year 2010" automatically adjusts the intervals for feeding the bacteria in the digester so that biogas production remains at a constantly high level.

### + Kreis-Dissolver

The Kreis-Dissolver increases gas yields compared with standard cutters by the optimum treatment of the feedstock.

### + Midsize agitator

The midsize agitator is used in the digester to thoroughly mix the substrates. At a reduced speed and with lower friction losses, it achieves a better level of efficiency than conventional mixers. The reason for this is primarily due to the larger propeller diameter.

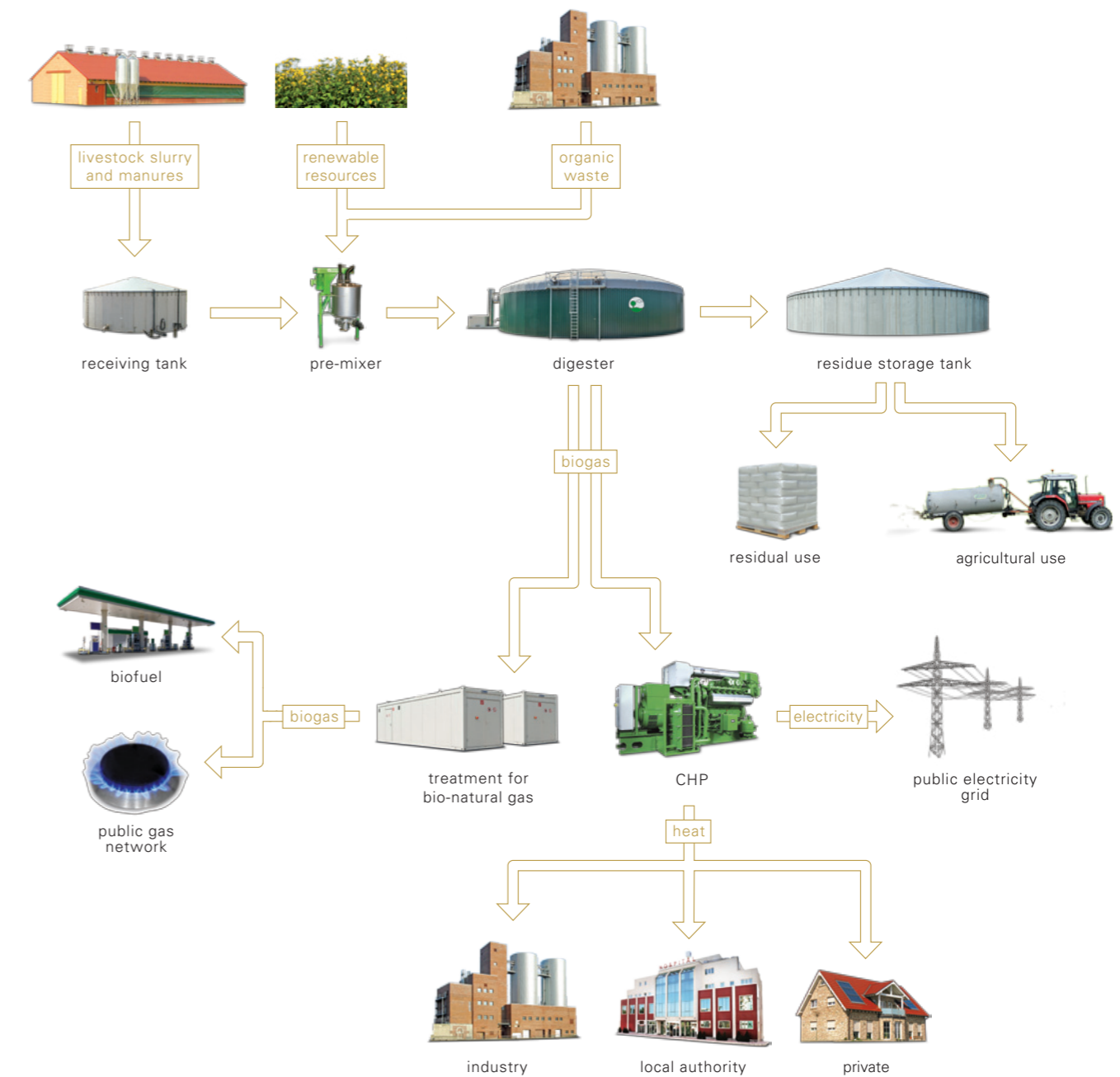
### + ORC technology

A considerable amount of the heat generated in the operation of biogas plants is discharged unused along with the exhaust gas. ORC technology increases the efficiency of a biogas plant by generating additional electricity from the exhaust gas. This electricity is then fed into the public grid along with the electricity produced by the biogas plant.



EnviTec's activities around the world

## The working principle of a biogas plant





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