

# MEGALINE 600 kW to 2 MW

The modular plant concept  
for investors and energy suppliers



# ÖKOBIT IN THE SPOTLIGHT

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As a major manufacturer and planner of biogas plants with over 130 national and international projects, ÖKOBIT is one of the most sought-after full-service suppliers within the biogas industry. We develop and build technically intelligent, substrate-flexible biogas and biomethane plants which perfectly correspond to the specific local conditions of our clients.

ÖKOBIT is an owner-operated company with a solid capital base and an exceptionally wide range of services and expertise. Our team of experienced engineers, business experts, as well as

energy and environmental engineers works with full commitment on the implementation of environmentally compatible biogas concepts operating on the highest level of economic efficiency. ÖKOBIT relies on established and exceptionally flexible technology concepts and ensures their effective and safe implementation. As a general contractor, in addition to expert advice and profitability calculations, we take on all tasks from planning and approval to turnkey plant construction.

## WHAT MAKES ÖKOBIT SPECIAL.

From development to operation: ÖKOBIT offers you all the services required for a biogas plant from a single source.

As enthusiastic engineers with business foresight, we use the best biogas technology available on the market. This technology is selected according to strict quality guidelines or specially designed and further developed in-house.

As yield-oriented business experts with technical expertise, we verify the economic viability of every project.

We actively seek a continuous exchange with our customers and operators and regularly conduct plant visits to take up and put into practice ideas and suggestions resulting from practical experience.

Our safety engineering exceeds industry standards. The safety-related acceptance of our biogas and biomethane plants is carried out during an independent inspection by an authorized expert.

ÖKOBIT is involved in research projects, associations and committees with the common aim of continuously developing industry standards further.

ÖKOBIT is fully committed to biogas and is made up by people dedicated to bioenergy who are always available for anyone interested in the subject.



# MEGALINE: INDUSTRIAL BIOGAS PRODUCTION

ÖKOBIT's MEGALINE series is a modular biogas plant concept ranging from 600 kW to 2 MW. Like all ÖKOBIT's biogas plants, the MEGALINE stands out for its ability to use different substrates, its energy-saving components, which are stable in operation, and its modular construction, which can easily be extended.

Every MEGALINE biogas plant is equipped with our state-of-the-art process visualization (ÖKOBIT INTERFACE).

## Energy-saving liquid feeding

MEGALINE uses the principle of liquid feeding for introducing the substrate. The silage or solid manure to be digested is first mixed with liquid and then pumped into the digester. This process significantly reduces the energy requirement in the fermentation tank of the MEGALINE biogas plant.

## Proven ÖKOBIT quality

ÖKOBIT biogas plants meet the highest technical standards. Hardly surprising, given that the biogas technology incorporates a decade of biogas experience and the passion of our engineers. The development of the plant systems has always been following the need of combining the highest level of quality and profitability in all phases of the plant's life cycle. Therefore, we use the best technology available on the market which is

selected according to strict quality guidelines or specifically designed and developed further in-house. The quality of every detail is decisive for the long-term profitability of a biogas plant. For this reason, we rely on technology and process solutions which have proven to be extremely durable, low in maintenance and easy to operate.

Having an experienced installation team the construction of a biogas plant takes three to six months on average, precise and on time.

## MEGALINE ADVANTAGES:

Investment security for investors and bankers

Fast returns due to short construction times

Reliable technology engineered by ÖKOBIT

Maximum operational reliability thanks to customized maintenance packages

Compatible with technology for local biogas ("micro gas") solutions

Easy to integrate gas upgrading

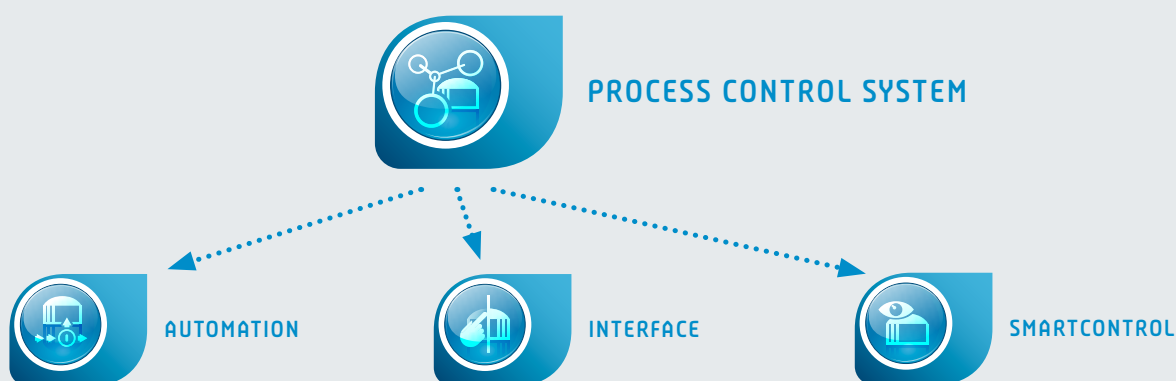


# MADE BY ÖKOBIT:

## THE INTELLIGENT BIOGAS PLANT

**The ÖKOBIT PROCESS CONTROL SYSTEM (PCS): Logically structured and intuitive to use.**

With our specially developed process control system, we provide you with practical support for optimising the efficiency of your biogas plant and specifically reducing the power requirement in order to maximize profitability. Despite the complex demands on the automation and measurement technology of the biogas plant, the ÖKOBIT PROCESS CONTROL SYSTEM is intuitive and easy to operate.



**The top-level basic package:**

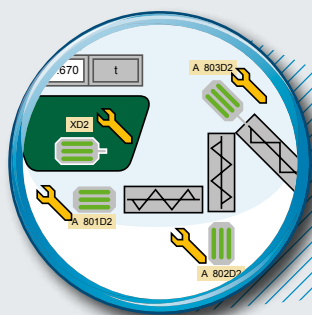
The integrated ÖKOBIT load management ensures a very low simultaneity factor. This saves connection and provision costs and guarantees both the efficient and the effective operation of the plant.

**Complex technology – easy to grasp:**

The ÖKOBIT HMI (Human Machine Interface) contains many helpful functions for an efficient system management which turn the control technology into an intelligent control centre. The operation is fast, easy and intuitive, whether on-site, from the office or even via smartphone.

**The intelligent biogas plant:**

We at ÖKOBIT are convinced that complex technology, biological process relationships and the experience gained from a large number of biogas plants can be combined into adaptive intelligence. This is our understanding of a state-of-the-art, intelligent biogas plant.



ÖKOBIT SMARTCONTROL, for example, automatically prepares maintenance schedules based on the measured values recorded during the monitoring process and notifies operators and investors automatically by e-mail about any pending action.

The necessity for imminent maintenance within a fixed tolerance period is indicated on the relevant unit on the P&ID by means of an orange tool icon. The tool turns red if maintenance periods are exceeded.



# MEGALINE: THE PLANT SYSTEM\*

## 01 Mixing tank

The mixing or collecting tank is used to collect and homogenize the liquid substrates.

## 02 Dosing unit

The dosing unit is used to introduce solid substrates into the biogas plant. With MEGALINE we use the energy-saving liquid feeding method. The silage or solid manure to be digested is mixed with liquid and then pumped into the digester or digesters.

## 03 Digester

The digestion of the substrates takes place in the digester. The ÖKOBIT digester is heatable, insulated, equipped with weatherproof cladding, accommodates several agitators and has a double membrane roof for gas storage.

## 04 Post-digester

The post digester is a gas-tight storage tank similar to a digester, except for the heating. A further "outgassing" of the fermentation mass takes place in the post-digester. The gas is stored through a double membrane roof system.

## 05 Fermentation residue storage tank

The fermentation residue storage tank is a tank for storing the outgassed or depleted digestate. The gas holder can optionally be supplied with a double membrane roof to provide an optimum gas management and a maximum gas storage volume.

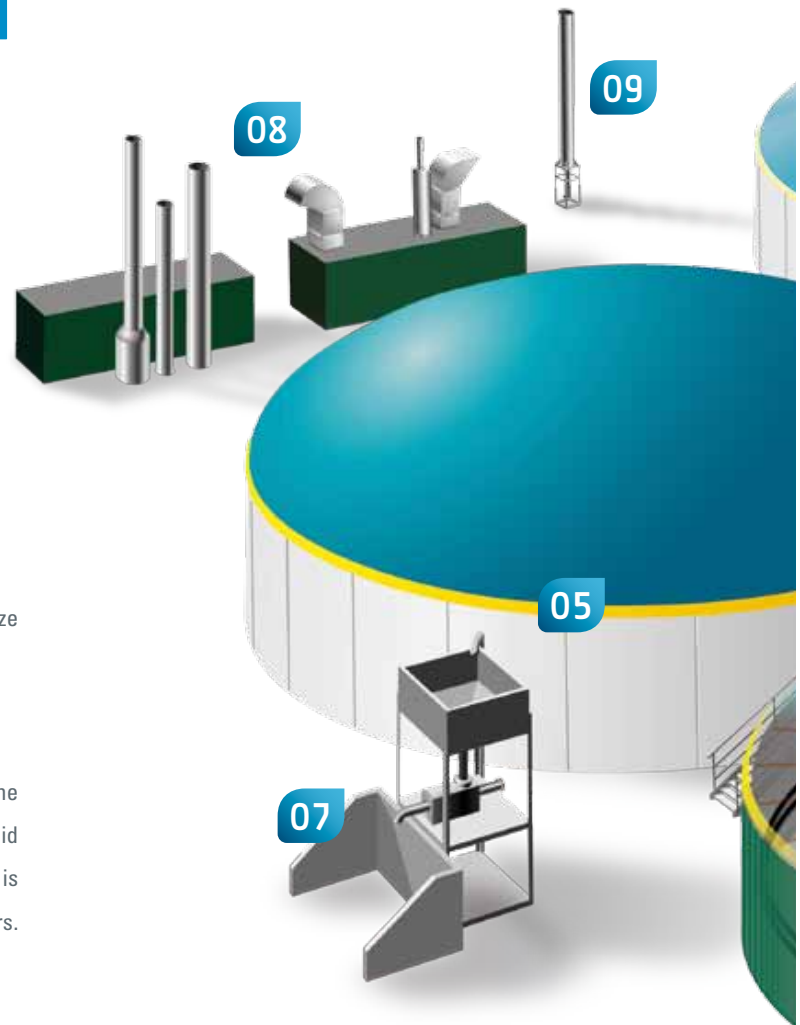
## 06 Pump container

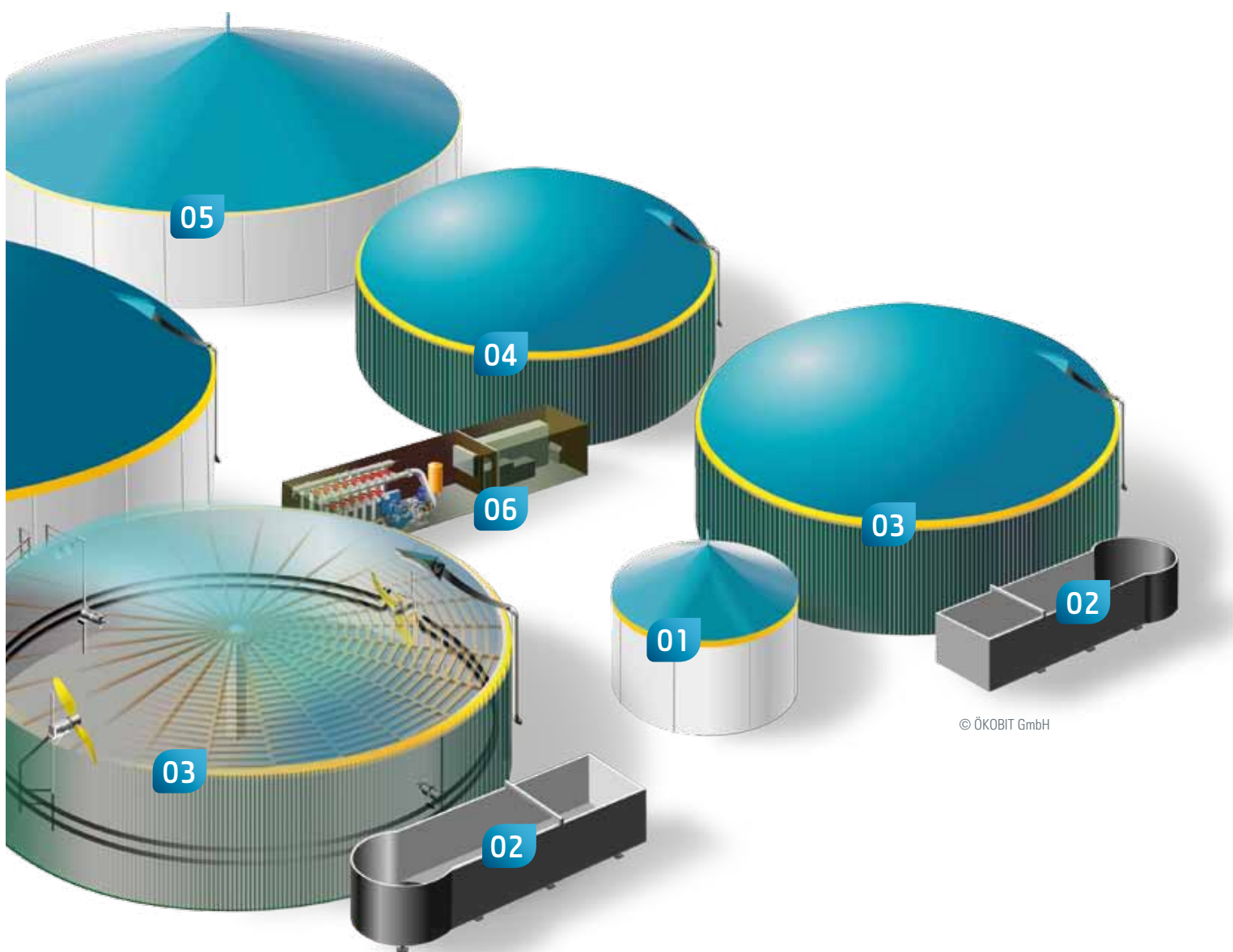
The ÖKOBIT pump system allows a free choice of substrate streams, i.e. substrates can generally be pumped from any tank into any other optional tank.

Thanks to an integrated multi-chamber solution, the container can also be equipped with a complete control cabinet and plant control technology.

## 07 Separator

Several practical and logistical advantages can be achieved through solid-liquid separation of the digestate using a separator: Minimization of the supply of external liquid and reduction of the need for digestate storage capacity.





## 08 CHP/gas upgrading

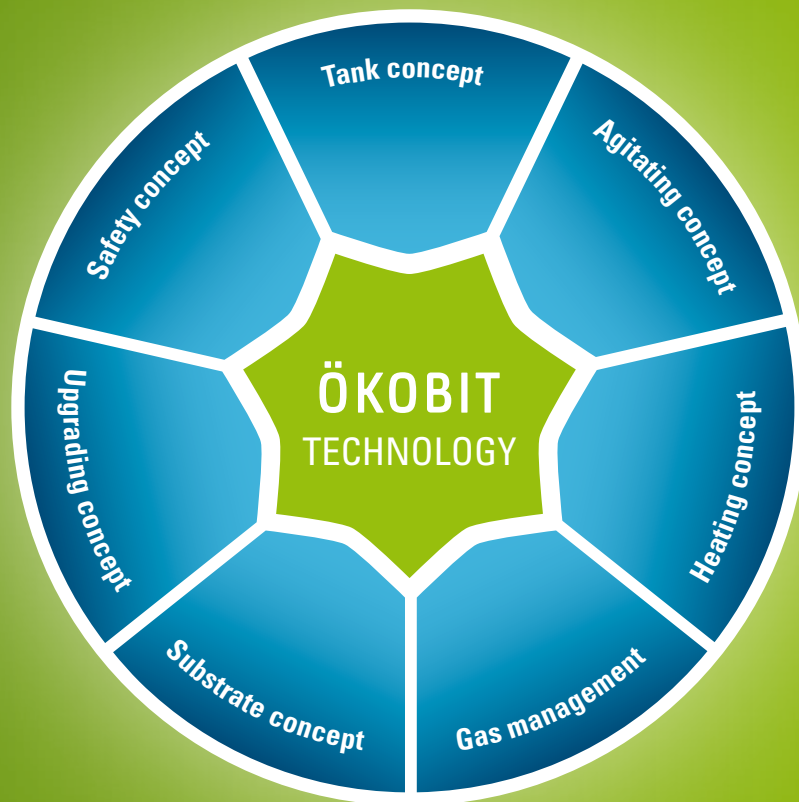
**Electricity or biomethane:** We develop the appropriate upgrading concept for the biogas produced. ÖKOBIT uses specially modified gas-engine combined heat and power plants (CHP) and gas upgrading plants. The highly efficient units are delivered ready-to-connect and integrate. Thanks to the ÖKOBIT gas management technology, different consumers can easily be combined, such as gas upgrading and CHP and/or gas boiler. We help you select the perfect gas upgrading method for your location.

## 09 Gas flare

The gas flare is part of ÖKOBIT's extensive safety concept.

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**\*All components and also their suppliers are subject to the strict testing criteria of the ÖKOBIT engineers. Special components are manufactured in-house.**  
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# HIGH-TECH FOR YOUR BIOGAS PRODUCTION



ÖKOBIT plant technology: adapted to the site, high-quality and easy to maintain. ÖKOBIT offers substrate-flexible, scalable biogas plant technology for your biogas and biomethane production. Innovative engineering, field-tested concepts, pre-

cisely matched components and intelligent detailed solutions guarantee the quality and functionality of ÖKOBIT biogas plants and ensure the economic success of our clients.

# ELECTRICITY OR BIOMETHANE?



*Background photo:  
Gas upgrading plant*

*Foreground photo:  
Combined heat and power plant (CHP)*



## The upgrading concept

ÖKOBIT offers plant operators all established upgrading systems for converting biogas into electricity and for the production of biomethane. At the same time you will benefit from our experience gained from a large number of projects using different upgrading concepts. We will give you professional

advice regarding the most economical plant concept and will analyse the best upgrading technologies for the location, independent of the manufacturer. No matter which process you choose, all ÖKOBIT biogas plants stand out for their constantly high gas yields and excellent process stability.



## PROJECT: ZEMMER/RHINELAND-PALATINATE

### TECHNOLOGY

1 mixing tank, 2 digesters, 1 post-digester, 2 fermentation residue storage tank, separation  
 Upgrading concept: CHP + micro gas network with satellite CHP, use of heating in a facility for  
 handicapped people in Schönfelderhof, Germany (hostels + workshops) + wood chip drying

### RATING


Plant rating: 680 kW<sub>el</sub> + 526 kW<sub>el</sub>  
 Biogas production/year: 4.9 million Nm<sup>3</sup>  
 Electricity production/year: 9.8 million kWh  
 CO<sub>2</sub> saving/year: 7,170 t

### SUBSTRATES

Renewable primary products + semi-liquid manure

### OPERATION

Construction period: 5 months, year of construction: 2007  
 Investor/operator: GSW Bioenergie Zemmer GmbH & Co. KG



"We are very proud of our project for an *integrated heat supply of facilities for handicapped people* and of our choice of technology. The MEGALINE by ÖKOBIT is an exceptionally intelligent and well-thought-out plant design with the vision we need."



Customer comment by Hans Josef Götten, Walter Winkelmann, Rainer Götten (from left to right)

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