

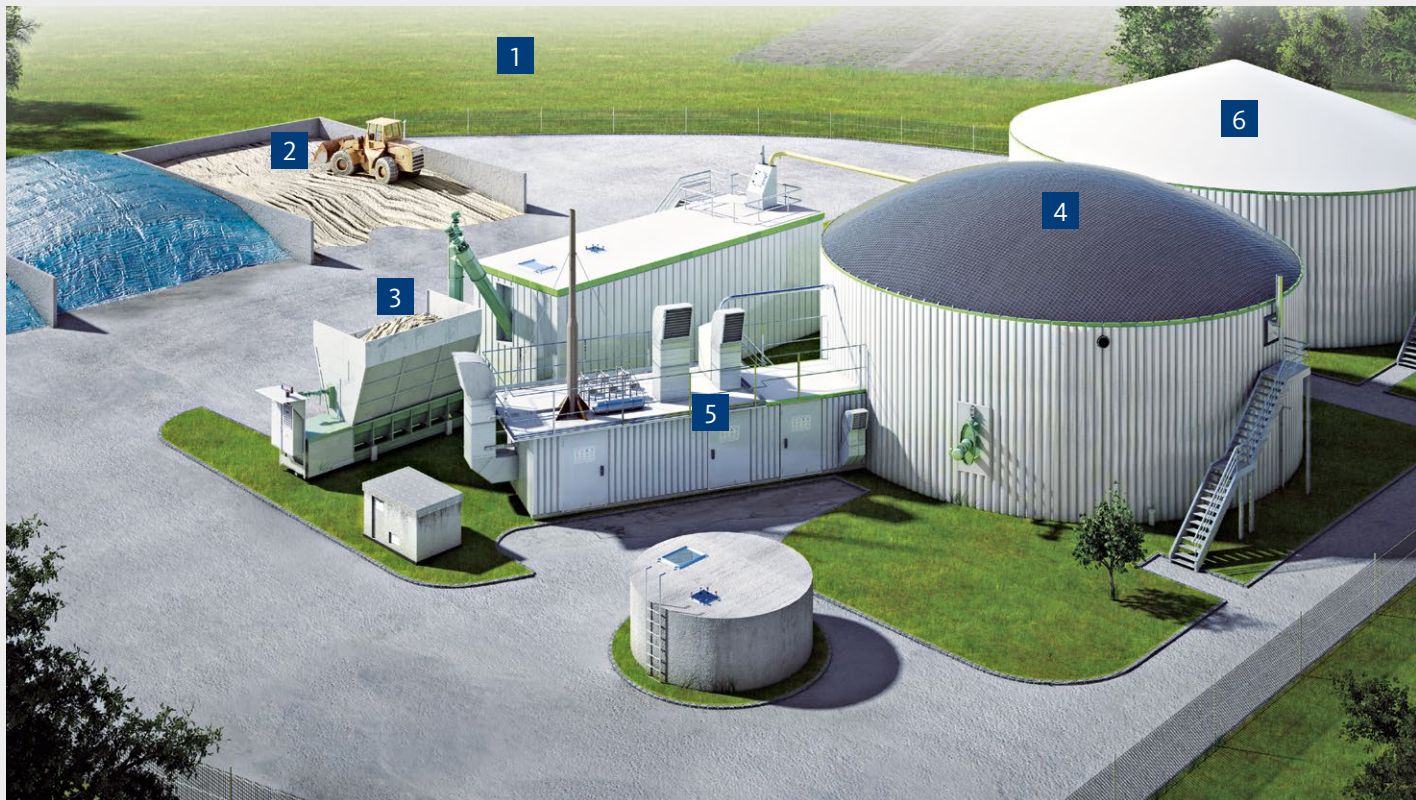


by Hitachi Zosen INOVA

## Technical and Biological Services Customised for Efficient Biogas Plants



## An Overview of Our Services



### **1** Entire plant

- Overall technical and biological optimisation and support
- Conversions and extensions
- Operational management
- Regular maintenance
- Design / approval
- Recurring inspections and documentation support

### **2** Raw materials/silo

- Raw material management
- Evaluation of feedstocks
- Silo extension
- Determination of DM / DMorg
- Fermentation tests/NIRS
- Silage quality

### **3** Charging

- Modernisation and optimisation:
  - Technical process
  - Biological processes
  - Energy usage
- Help with process disruptions
- Operating resources

### **4** Digester

- Review and optimisation of agitator technology
- Gas tank replacement/management
- Concrete dome renovation
- Wastewater analytics
- Process analytics

### **5** CHP unit/technology centre

- Regular maintenance
- Greater flexibility
- Biogas cleaning
- Heat utilisation/concept
- Gas conditioning

### **6** Fermentation residue store

- Modernisation and new build
- Fermentation residue analytics
- Fertiliser value (DüMV)
- Determination of heavy metals (BioAbfV)
- Fermentation residue treatment
- Fermentation residue management



## High-Performance in Every Respect

# From Analytics to a Complete Overhaul

From technical and biological services to operational management and complete modernisation of your plant, HZI Schmack offers a comprehensive service package tailored to your individual needs. With our many years of experience in all aspects of biogas plants, we can provide you with wide-ranging, expert advice.

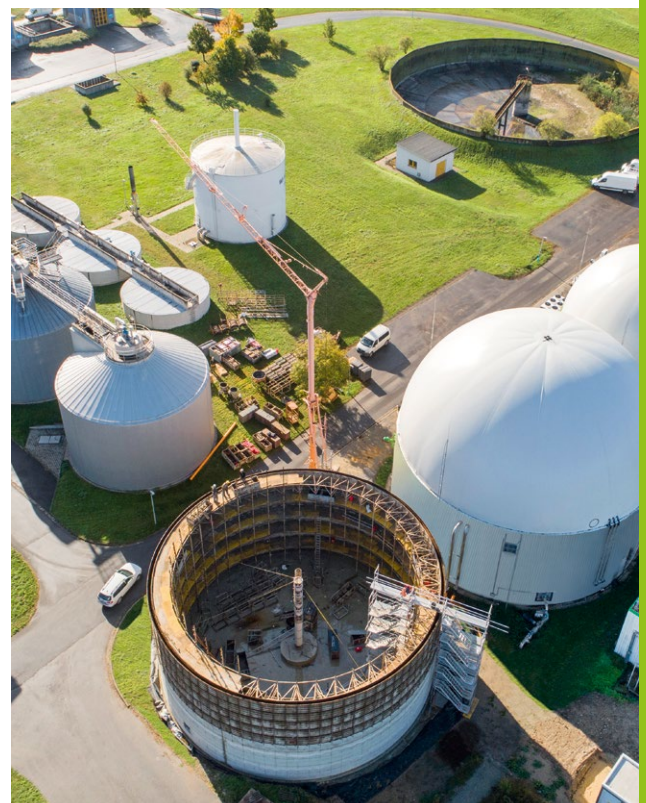
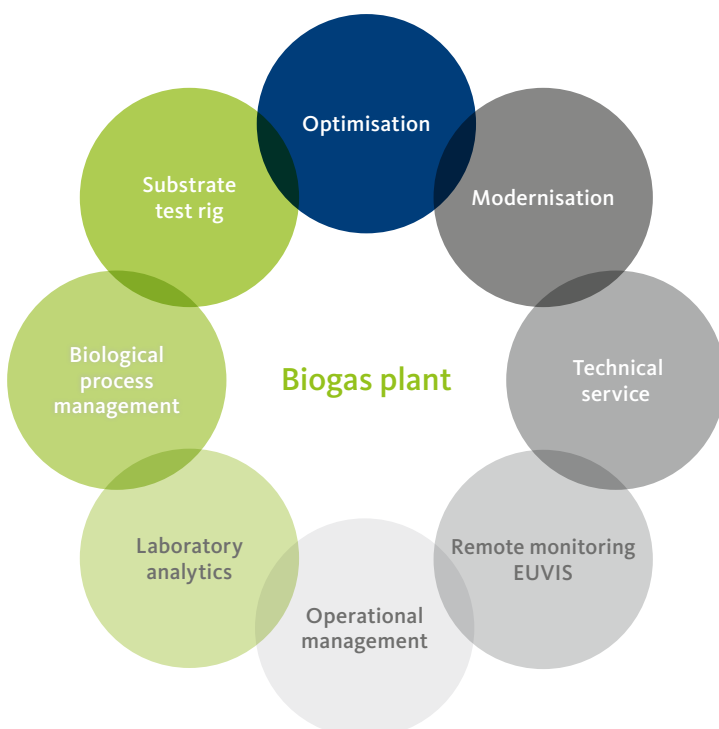
HZI Schmack's service concept enables operators, whether they're farmers, municipal services or power supply utilities, to select precisely the modules that best meet their needs and requirements. Our service network of specialist employees is always at hand to give you advice and assistance.

As one of the leading German suppliers in the biogas sector, Schmack has received multiple awards for its innovative technologies and processes. Numerous certificates attest to the high quality of our products and services.

As part of the Hitachi Zosen Inova Group, we offer you even more options for the future-oriented operation of your biogas plant, including two gas upgrading technologies, solutions for producing renewable fuels and using CO<sub>2</sub>, and power-to-gas systems.

« Draw on HZI Schmack's service expertise to keep your plant running successfully, safely and efficiently for many more years. »

## The service expertise of HZI Schmack



Fit for the future with an overhaul

## Optimisation and Modernisation

# Shape up Your Biogas Plant!

Biogas plants are subject to wear and tear and, like all installations for generating energy, are designed for a certain service life. To be able to continue operating older plants economically, it's essential to take a proactive approach to planning modernisation projects.

Often even minor conversion work or modifications to the biological, technical and organisational elements are sufficient to increase overall efficiency.

The possibilities vary from plant to plant. For this reason the HZI Schmack service team will work with you to develop an individual optimisation concept for your plant. We do an accurate analysis of the costs and benefits to determine the untapped potential of your biogas plant and develop comprehensive solutions. When reviewing your processes we draw on expertise gathered over more than 20 years.

Plant modernisation increasingly involves replacing old components with new, more effective and energy-efficient ones. We will show you what new products are on the market and which components are best suited to you. We use only components

that have been developed in house or high-quality components from reputable manufacturers.

Of course, in addition to delivery and installation we can also perform complete integration, including commissioning.



You can boost the overall efficiency of your plant by upgrading to more effective components such as the REMEX® SF agitator

« From contractual to unscheduled work,  
you can rely on our service. »

### Our Services in Detail:

- Technical and commercial optimisation
  - Weak point analysis
  - Determining process-related KPIs
  - Developing an optimisation concept
- Design / approval
- Modification / upgrade
- Extensions / conversion

### Take Advantage of These Benefits:

- › Individual modernisation concept to optimise performance and yield, tailored to your plant
- › Compliance with all operational safety regulations
- › Extending the life cycle of your plant
- › Increased profit through improved efficiency
- › Reduced CO<sub>2</sub> thanks to process optimisation

## Technical Service

# Your Plant in the Best Possible Hands



From contractual to unscheduled work, you can rely on our service team



Regular inspections assure the reliable operation of your plant

If you don't want to leave anything to chance when it comes to the operation of your biogas plant, it's best to take out a regular maintenance contract with us.

Under this contract we check the technical condition of your plant at regular intervals. Technical faults and risks will be detected at once and can be remedied immediately without long downtimes. We also take care of scheduling, control and coordination, as well as planning the necessary materials.

Depending on your requirements you can take out a regular maintenance contract for the entire biogas plant or for individual areas only.

From motor oil analytics to major repairs, from maintenance work to a complete overhaul, you can rely on the experience and expertise of our service technicians and partners. We'll work with you to make sure your biogas plant delivers a high level of technical performance and operates smoothly.

If components are worn, we supply the necessary spare parts, quickly and cost-effectively.

« Even the best plant technology needs servicing and maintenance. »

### Our Services in Detail:

- Regular servicing/ maintenance
- Recurring tests
- Revision
- Replacing individual components
- Procuring spare and wear parts

### Take Advantage of These Benefits:

- › High system availability
- › Downtimes avoided
- › Maintaining operational reliability



## Remote Monitoring EUVIS

# Control is Good, EUVIS Remote Monitoring is Better



EUVIS control centre

As the operator of a biogas plant, you have more important things to do than constantly monitor its level of performance. You can leave this to HZI Schmack's EUVIS control centre.

It's manned by our staff 24 hours a day, 365 days a year, to remotely monitor your biogas plant. They keep a close eye on all the relevant figures and parameters related to the biogas process.

Using these individual readings and comparing them with other systems in our data pool, we can detect irregularities in operation at an early state and respond quickly to any fluctuations in performance.

Stepping in to take action before it's too late: Thanks to the EUVIS team you can be sure that your biogas plant will run reliably at a high capacity utilisation rate.

« EUVIS remote monitoring assures the highest level of operational reliability, 24 hours a day, 365 days a year. »

### Our Services in Detail:

- Continuous monitoring 24 hours a day, 365 days a year
- Seamlessly recording all process-related data such as gas quality, quantity and pressure, as well as temperature and fill level
- Staff available around the clock for fault analysis and troubleshooting

### Take Advantage of These Benefits:

- Early detection of process disruptions
- Short response times
- Long downtimes avoided
- High system availability

## Laboratory Analytics

# A Good Fermentation Process Begins in the Lab

In addition to safe and reliable plant technology, a stable fermentation process is an essential factor in the profitability of your biogas plant.

To this end our accredited\* in-house laboratory offers comprehensive analytics for biogas plants, from the evaluation of different feedstocks to fermentation process control and assessment of the fermentation residue.

We use advanced analytical instruments and methods to provide you with fast and reliable results on the current fermentation process variables. On the basis of this data our specialists will make recommendations for improving processes. Together we assure the stable, economic operation of your plant.



Determining the dry matter content of substrates and digester contents

« We examine your fermentation process closely and improve it.»

### Our Services in Detail:

#### Feedstock Evaluation

- Gas yield, silage quality, dry matter, etc.

#### Process Assessment

- Fatty acid spectrum
- Inhibitors
- Trace element concentration
- Experience from more than 75,000 process analyses

#### Analysis of Fermentation Residues

- Nutrient analytics
- Analysing and sampling as per the German Ordinance on Biowastes (BioAbfV) and sewage sludge analysis as per the German Sewage Sludge Ordinance (AbfKlärV)
- Analytics within the framework of the German Cultural Landscape Programme

### Take Advantage of These Benefits:

- › Highly stable fermentation process
- › Economically reliable operation
- › Fermentation processes monitored; immediate assistance and optimisation as required



\* Only applies to the test methods specified on the accreditation certificate.

## Process Biology Support

# We Help You Discover the Potential of Your Biogas Plant



Preparing a sample for trace element analysis

Benefit from the specialist expertise and experience of our scientific staff amassed over more than 20 years. You can choose between different levels of support. Whether you opt for an initial biological consultation, advice on process disruptions or complete Fit for Biogas support, our specialists are always there for you.

Whenever you need it you will receive specific, sound advice on any biological process-related questions you may have. Based on our analyses and recommendations you will know exactly what needs to be done to increase the yield from your plant.

We will also deal with all the documentation for you in accordance with the requirements of the relevant gas grid operator.

Digester additives can also help improve the fermentation process. Only with the right additive can the fermentation process run constantly at the highest level. We have special products such as novoDYN® trace element mixture, trace element pure salts and METHANOS® to help your plant achieve optimum performance.

To prevent specific deposits and the consequences we can recommend our product RockAway.

« From initial consultation to the full Fit for Biogas support package, we have the right service for you. »

### Our Services in Detail:

- Process analytics / process assessment
- Interpreting analysis results
- Feeding recommendation
- On-site support and advice
- Monitoring as required
- Reports and short surveys
- Contract options tailored to your needs

### Take Advantage of These Benefits:

- › High plant capacity utilisation
- › Process biology stabilised
- › Fermentation process seamlessly documented
- › Compliance with regulations, directives and legislation



## Substrate Test Rig

# Your Biogas Plant on a Laboratory Scale

We have several miniature digesters to try out new feedstocks by fermenting substrates and types of waste and test their suitability as biogas substrate. Our pilot plants are in continuous operation and are analytically monitored, and the fermenting

organisms are examined in the biology lab. These test units will gather the entire range of resilient, practical data for you to transfer directly to your own biogas plant.

« For fermentation with the best possible gas yield  
we adapt the structure of the trial to your individual requirements. »

Fresh substrate every day, permanent monitoring: the pilot digesters provide reliable data that translate 1:1 into practice. We also test additives for fermentation and various modes of operation, for example with different temperatures or pH values (hydrolysis)



### Our Services in Detail:

- Continuous wet fermentation of different substrates
- Optimising the operation of biogas and waste plants
- Declarations on biological and technical load limit
- Microbiological process analysis
- Recognising inhibitory effects
- Flexible gas production through flexible feeding (improved flexibility, demand-driven feeding)

### Take Advantage of These Benefits:

- › Expert partners with specialist knowledge of biology and technology gathered over many years
- › 25 different digesters with volumes from 5 to 200 litres
- › Individual test rigs set up in consultation with the client
- › Process closely tracked, with fermentation monitored online
- › Comprehensive data capture and analytics with final summary report

## Operational Management and Raw Material Management

# The All-Inclusive Service for Your Biogas Plant

Would you like to keep the work involved with your biogas plant to a minimum? No problem. Under our all-inclusive service package we take care of complete operational management, including administrative work, on your behalf.

The sum of the operating costs is the most important factor in the profitability of your biogas plant. Don't leave it to chance – put your plant in the hands of our trained specialists. The all-inclusive service guarantees you optimum process conditions and maximum operational reliability. You benefit from over 20 years of biogas experience.

We take care of the technical and biological management of your plant, including remote monitoring, maintenance and procuring raw materials.

Raw material costs are also an important parameter in the success of your biogas plant. Sustainable cultivation makes these costs calculable. That's why HZI Schmack has its own raw materials department.

Our specialists work with growers to develop individual, sustainable crop rotation concepts for optimised land use. They coordinate the work all the

way from the procurement of raw materials through to harvesting, preservation and fermentation residue spreading.

We aim to achieve low raw material costs while at the same time assuring the preservation of biodiversity and water protecting, as well as considering alternative energy crops.



We treat your biogas plant as an integral whole

### Our Services in Detail:

#### Operational Management

- Technical operational management and coordination of plant operation
- Proactive maintenance (including stocking spare and wearing parts)
- Biological support (analytics, trace elements and feeding schedules)
- Quality, safety and document management (organisation and monitoring of recurring inspections)
- Process optimisation (recommendations for conversions, extensions and new statutory remuneration schemes)
- Raw material and fermentation residue management

#### Raw Material Management

- Advising on cultivation optimising crop rotation
- Substrate and raw material management

### Take Advantage of These Benefits:

- › Calculable operating costs thanks to proactive plant operation
- › Optimum plant operation
- › Team of experts with many years of experience in plant management and an extensive service network
- › Long term limitation of operating costs through comprehensive, proactive plant management, from the procurement of raw materials to optimised plant operation and fermentation residue spreading



Regenerative raw materials are compacted for delivery

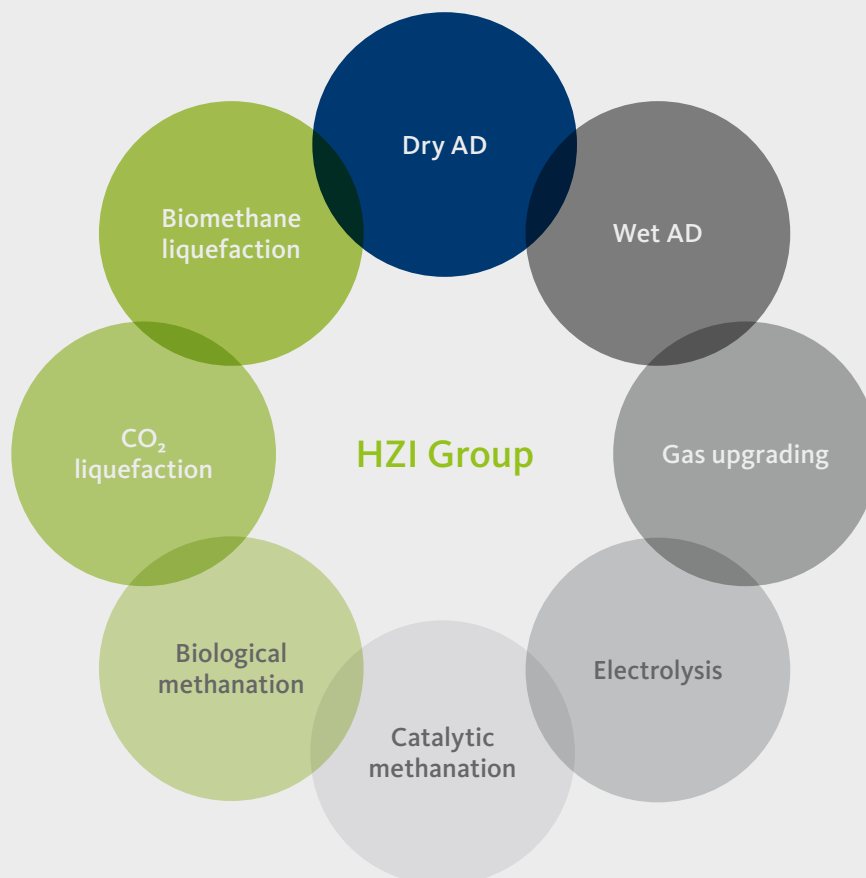
## Future-oriented Solutions from a Single Source

From the regular inspection of individual components or the entire plant through to a comprehensive service contract, HZI Schmack GmbH in association with Hitachi Zosen Inova AG offers you customised solutions to suit your requirements. The services we offer you are based on a modular concept.

### Discover More Opportunities

In the context of the energy transition and global climate protection efforts there are also diverse opportunities in connection with biogas technology. This is because green gases from renewable sources

are indispensable for energy supply and decarbonisation worldwide. From biogas and biomethane to hydrogen and synthetic natural gas, HZI offers the entire product range for the production of renewable gases and carbon-neutral fuels. In combination, these technologies provide solutions that will enable the efficient use of resources and sustainable energy generation for decades to come.



« Visit our Urban Waste Energy Network  
at [www.hz-inova.com/sustainability](http://www.hz-inova.com/sustainability) and explore the various possibilities! »



