

Best productivity. Every time,  
every season, with GEA Service.



# GEA Service for Breweries

Partnership for Efficiency

# GEA Service – For your continued success

Improve the life cycle cost of your plant and equipment.

We work alongside our customers in close partnership, supporting them throughout the full life cycle of their equipment and solutions ensuring lasting business success.

## Getting you started

We start as we mean to go on, a supportive and committed partner for life. We plan and build around individual needs, sharing process knowledge, training staff and supporting operators to get our customers up and running and ensure a smooth, seamless on-going service.

## Keeping it running

To ensure our customers benefit from continuous production processes for minimal unexpected downtime, we provide fast support, efficient maintenance and top quality spare parts, whenever and wherever needed.

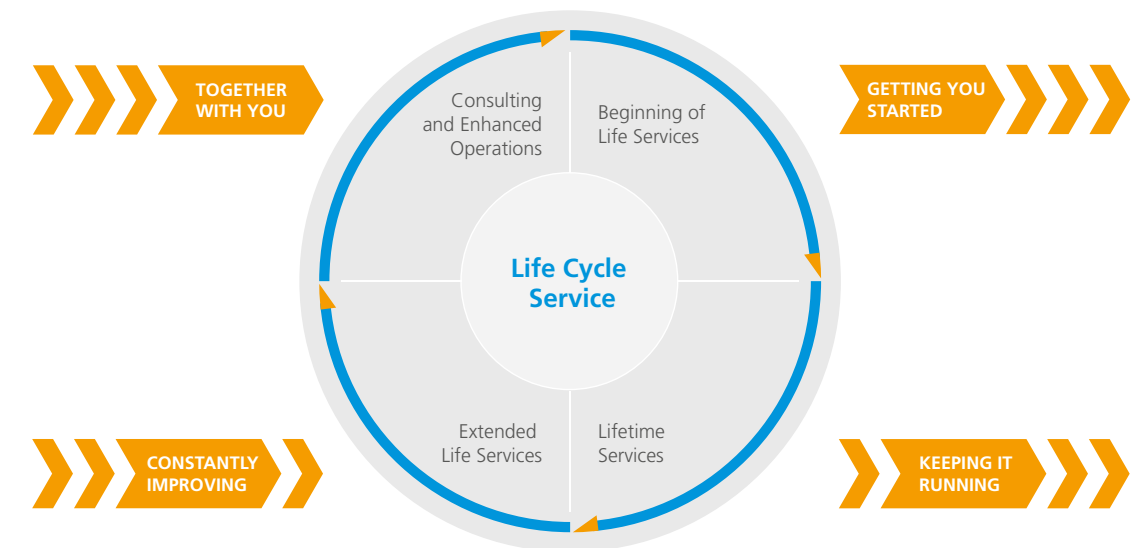
## Constantly improving

We safeguard our customers' investments by constantly looking ahead, by modernizing or upgrading of equipment and optimizing of processes to meet changing needs and new market demands. We are always working to increase production efficiency and ensure peak performance.

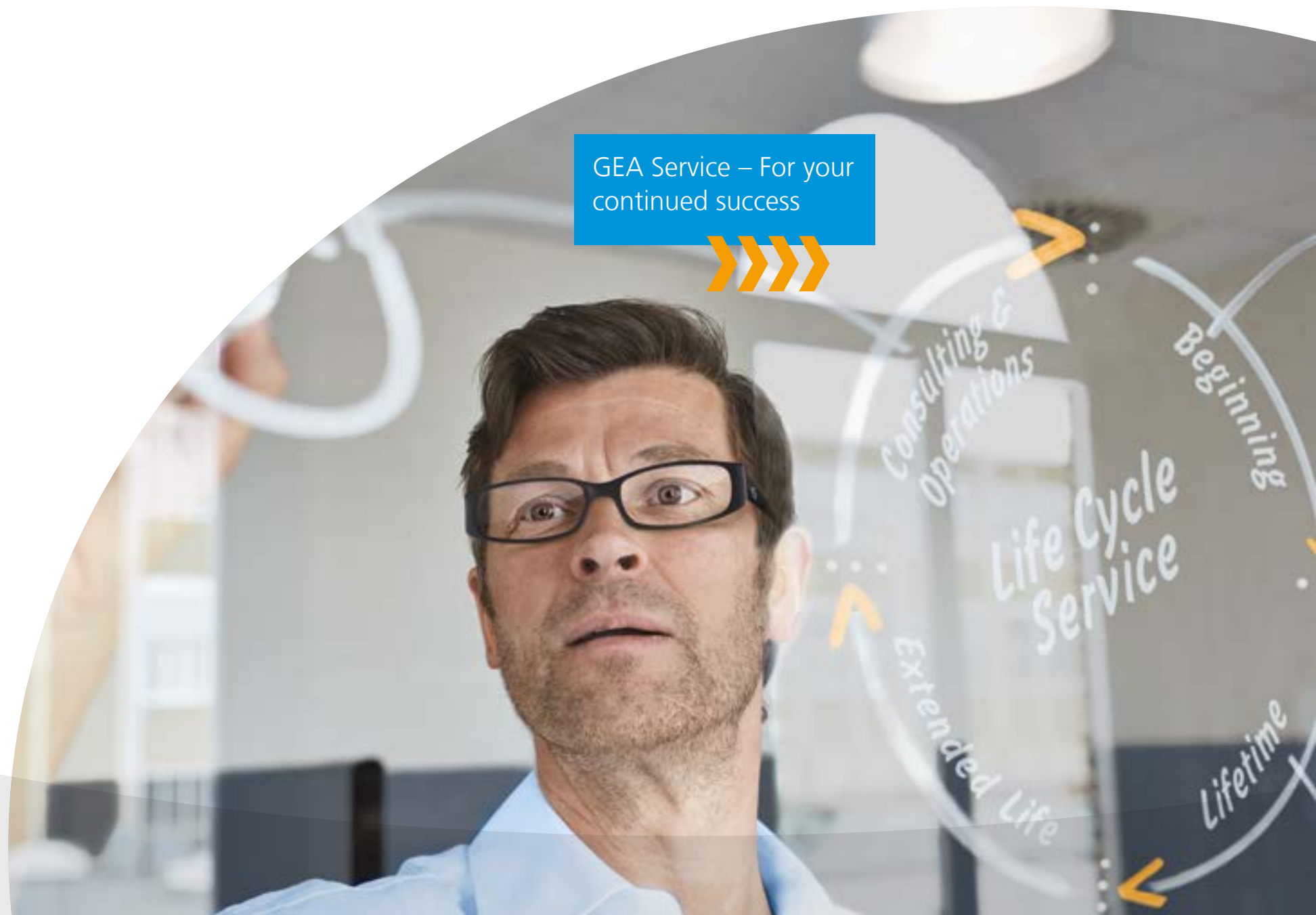
## Together with you

Commitment to our customers and their business means investing in their objectives, their risks and their future success. We work in ever closer collaboration, providing on-going systems audits and on-site support, in order to generate improved performance through innovative new service models.

Four stages of continued success



GEA Service – For your  
continued success





# Seamless support for instant productivity and performance

## Installation – Supporting you right from the start

Enter into a partnership with a dedicated team of GEA service experts to guarantee the safe and efficient installation of the plant. We provide an initial project analysis and a selection of the most suitable layout of the plant, engineering of the process control system as well as production technology. Engineering installation and process experts combined with established manufacturer's know-how ensure the optimal plant performance from day one.

## Commissioning – Expertise of upstream and downstream process

We understand the complete production process inside out and have a distinct interface competency, that's why we are able to set up your equipment, process line and plant in the most effective way. You can look forward to maximum safety and production reliability at all times.

## Training – Tailored to your needs

Our certified and experienced service engineers train your employees – on site or in one of our modern training centers. They will provide your employees with comprehensive operations training, process knowledge and asset health awareness so they can safely and expertly run and maintain your plant and processes from day one.

All training modules are tailored to the individual needs of your business

- Optimum plant and equipment efficiency
- High plant availability and reliability
- Highly-qualified and efficiently trained personnel
- Asset health awareness

By sharing our knowledge, we help to ensure your business benefits from maximum efficiency and minimum downtime.

GETTING YOU  
STARTED





# The cost-effective way of ensuring safety and reliability

## Original Spare Parts – Maximum performance of your system

Genuine spare parts from GEA provide the customer with the safety level required to improve the efficiency of his plant.

Your benefits from our comprehensive and efficient spare parts service

- Highest safety level
- Long-term availability
- Optimized delivery times
- Maximum service life
- Highest quality standards
- Optimized spare part management (based on the criticality analysis)

Original spare parts from GEA offer reliability and protect your investment. The high quality spare parts keep you up and running at maximum efficiency. They are manufactured to extremely high standards and come with a warranty. In addition, customized pre-analysis of the critical spare parts, short delivery times and constant availability guarantee safe and reliable operation of your equipment at all times.

## Corrective Maintenance – Skilled service engineers to count on

The repair service of GEA stands for care, precision and responsibility of the manufacturer. In consideration of the plant complexity, we are able to carry out repair work in the brewery on site – around the world, wherever you need us!

GEA repair service is never far away, so you benefit from

- Know-how of the plant manufacturer
- World-wide availability
- Highest safety and functional standards
- Maximization of plant availability

## Preventive Maintenance

GEA's preventive maintenance programs keep plant and equipment operational and extend their working life – time-based servicing costs less than fault repairs. Our trained specialists do it fast and reliable globally.

- Up-to-date manufacturer know-how
- Optimally maintained machines
- Maximum operation/production reliability
- Optimization of product quality



KEEPING IT  
RUNNING



## Audits – Transparency for informed decision making

The launch of new products and changes in production can reduce the efficiency of many breweries should modifications be carried out incorrectly.

Optimization services such as the brewery audit are used to adjust the performance of existing systems to make sure the equipment can effectively handle production. Re-configuring the equipment also increases efficiency and reduces product losses.

Existing product lines may require modernization over a plant's lifecycle – either to enhance production capacity or new regulations may require modernization or upgrading.

GEA has knowledgeable and experienced service technologists to evaluate the feasibility and benefit of upgrading existing equipment. We provide a broad range of equipment upgrades to improve the performance and prolong the lifespan of your brewery equipment. Our comprehensive library contains most original documentation along with any updates.

### The typical situation

- Everybody recognizes optimization potential, but it is difficult to evaluate.
- Reluctance to intervene in the existing process.
- No monetary evaluation of malfunctioning and losses performed.
- Minor modifications are implemented, but the overall optimization potential remains unacknowledged.
- Reduced mechanical equipment performance over the years.

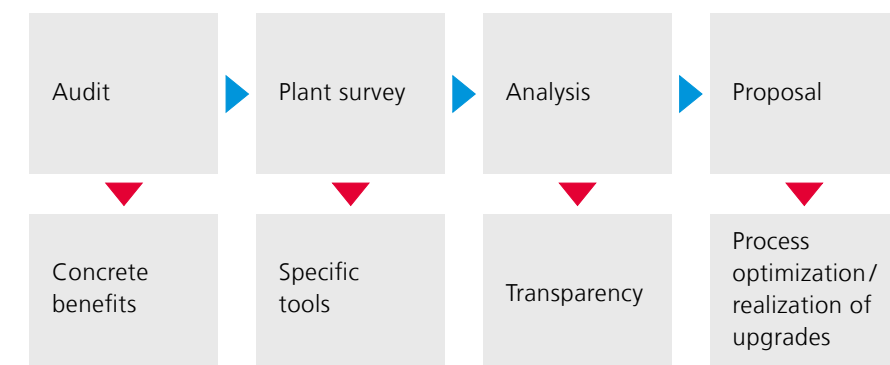
An audit evaluates your brewery's potential and develops improvement suggestions including calculation of the return time for the improvements.

### TECHNOLOGICAL AND/OR MECHANICAL BREWERY AUDIT

Our customers can choose from different service modules to define their own individual service level

CONSTANTLY  
IMPROVING

### Audit concept



YOUR IMMEDIATE  
BENEFIT FROM AN AUDIT

- Immediate value for customers through process optimization
- Reduction of operating costs
- Increase in plant efficiency
- Reliable and optimized working conditions
- Solutions to problems
- Forward looking concepts
- Mechanical evaluation and recommendation for improved performance on equipment

Savings from an audit may vary from brewery to brewery – however, most of our plant audits provide end-users with savings thanks to our advice.

Our audit has 3 phases

Phase 1 – Data collection & preparation of a quotation

- Prior to the actual audit, GEA will start researching optimization potential and ask the end-user about the desired improvements (special questionnaires for process data collection). An in-house service technologist will make the analysis.
- An analysis of the received process data and current mechanical condition of the equipment is then used in a discussion with the end user in order to provide more detailed insight into actual on-site conditions.
- A clear definition of the audit scope to meet end-user requirements, calculate the audit and prepare the quotation.
- Information extracted from the initial data collection and discussions is used in the quotation and the duration of the audit is adjusted to meet end-user requirements.
- If needed, GEA shall provide a detailed audit procedure explanation and audit scheduling.

Phase 2 – On-site auditing

Ideally, an efficient audit includes having a project manager appointed by the brewery, who is available throughout the audit – ensuring common understanding throughout the audit. GEA will

- Arrange the kick-off meeting with the end-user staff; create a process evaluation and evaluate the equipment's technical condition during production. If required, equipment can be stopped and given a more detailed inspection. If possible and appropriate, process optimization is performed on site.
- On a daily basis discuss the initial findings with brewery staff regarding optimization potential found and next steps to be taken.
- Arrange a final meeting with the brewery staff and present the initial findings on the last day of the audit.

Savings potential for brewhouse yield				
Sales beer [hl]	2,500,000			
Malt price [€/t]	450			
Malt load/brew [kg]	11,000	Total evaporation	7.12	% ref. to kettle-full volume
Malt extract air-dry [%]	76			
Kettle full [hl]	580			
CW hot [hl]	540			
CW cold [hl]	520			
Extract CW hot [°P]	14.8	Brews/year	4,800	
Extract CW cold [°P]	14.8			
Extract kettle-full [°P]	13.8			
Extract kettle-full [TE%]	14.55			
Extract CW hot [TE%]	15.66			
Extract CW cold [TE%]	15.66			
Brewhouse yield OBY [%] before optimization	97.42			
Malt costs/brew [€]	4,950			
Malt costs/year [€]	23,760,000			
Brewhouse yield OBY [%] after optimization	97.92	Increase in yield	0.5	%
Malt load/brew [kg]	10,944			
Malt costs/brew [€]	4,925			
Malt costs/year [€]	23,638,678			
Savings/year [€]	121,322			

Phase 3 – Data analysis, audit report and suggestions for optimization

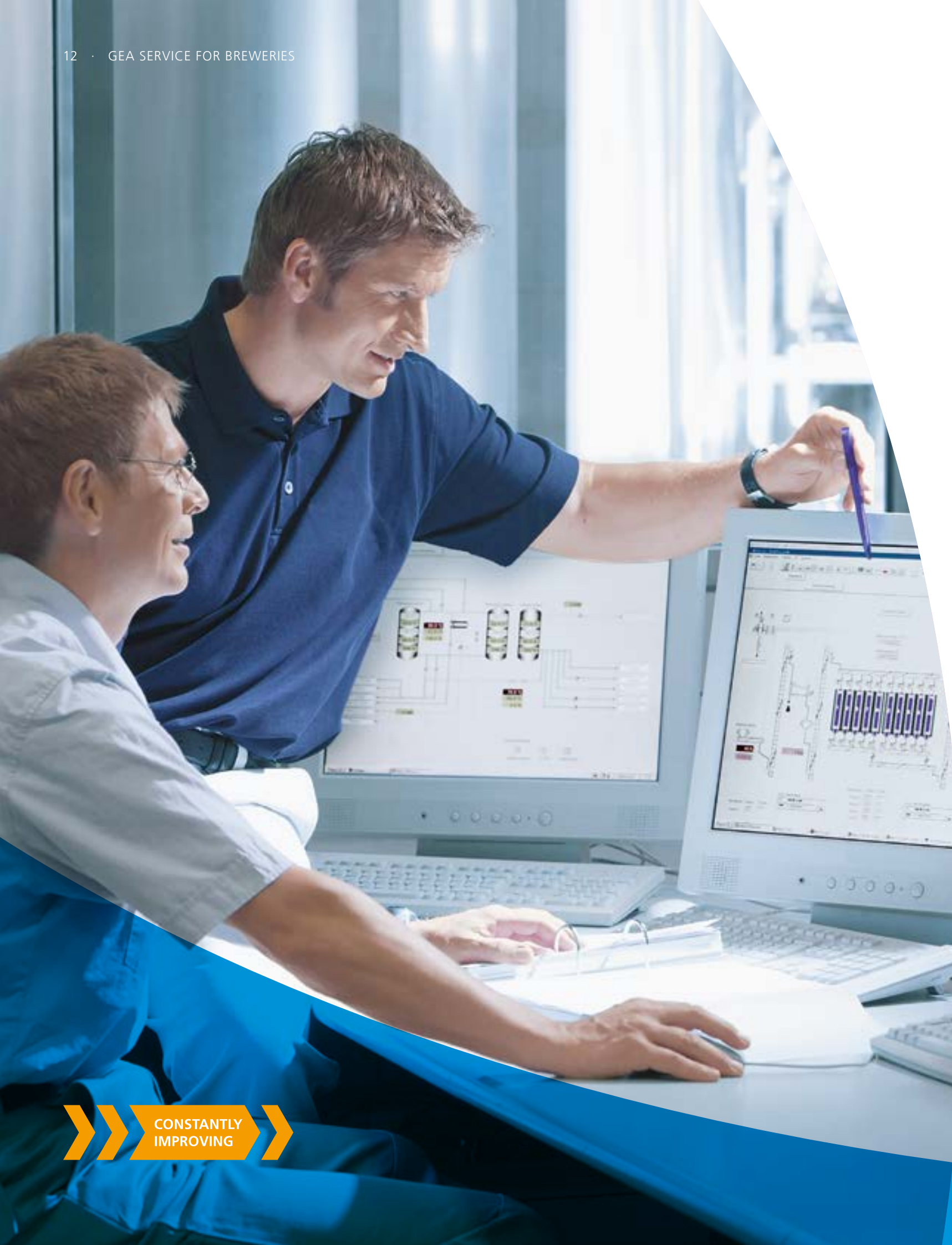
- GEA analyzes the data collected on site and prepares optimization suggestions.
- GEA will thus present and submit a comprehensive report with information about optimization potential and return on investment calculations within 2 to 3 weeks after the audit.
- The results are supplemented with a detailed quotation if the plant performance can be improved further with the upgrade solutions from GEA.

You thus receive an audit report highlighting optimization potential and including ROI calculations – transparency to make informed decisions for plant performance at a high level.

We provide mechanical / technological expertise for the following areas

- Brewhouse
- Cold process area
- Refrigeration plant
- CO<sub>2</sub> recovery plant
- CIP
- Thermal energy
- Water





## Upgrade – our Innovations, your Benefits

Experience reveals that equipment or process technologies require adjustment over time due to new demands placed on equipment and production technology. A failure to adjust can reduce system efficiency.

### Numerous reasons may be behind the reduction:

- Different raw materials
- Modified workflow
- Change of equipment properties
- Undocumented system parameter settings

External factors have also shifted our customers' perceptions of benchmarks including specific water consumption in specific production areas, the total CO<sub>2</sub> demand for production or the required amount of CIP media.

GEA has tailored audits and a dedicated team of brewing technologists and process technology experts to focus on improving efficiency and consumption data at your brewery.

Engineers apply the latest expertise and innovative technology in every GEA brewery plant in order to produce high quality beer with optimum energy utilization. Our customers expect such expertise and are right to do so.

We offer comprehensive modernization and expansion services to ensure high product quality, plant efficiency and plant availability for many years.

Our service begins with a detailed analysis. Your brewery equipment is thoroughly checked and evaluated in an audit. This audit can be conducted for individual plant sections or for the entire brewery including refrigeration and process automation. All important process parameters as well as safety aspects, energy consumption etc. are taken into account. Special attention is given to value creation: raw materials quantities, energy expenditure, yield and output.



# Optimization in the Brewhouse

## Your lautering system at LAUTERSTAR™ performance level

Your lauter tun will also have the same performance level as the LAUTERSTAR™. The upgrade can easily be executed gradually.

### Yield

- Yield increases of up to 2 percentage points are possible

### Capacity

- Optimizing the lauter tun shortens the lautering process as well as ancillary process steps and leads to a higher brewhouse capacity

## JETSTAR™ – for minimum total evaporation

The JETSTAR™ breaks the wort boiling process down into two distinct steps: thermal conversion and evaporation.

This improves the efficiency of wort boiling, saves primary energy and improves wort quality.

### Energy

- Boiling with JETSTAR™ can reduce total evaporation to less than 4 %
- Immediate impact on fuel consumption, particularly in atmospheric kettles without energy storage system

### Quality

- Gentle heating and homogeneous wort treatment reduces the thermal load on the wort
- Beers have improved flavor stability and conservation of foam-positive protein fractions

## Efficient use of heat with an energy storage system

The thermal energy required for evaporation during wort boiling is easily recovered with more than 90 % efficiency and directly reused in the brewhouse. Low pressure boiling combined with our energy storage tank design allows a wide range of evaporation rates. The system is balanced at 4.5 % total evaporation and no hot water surplus is generated.

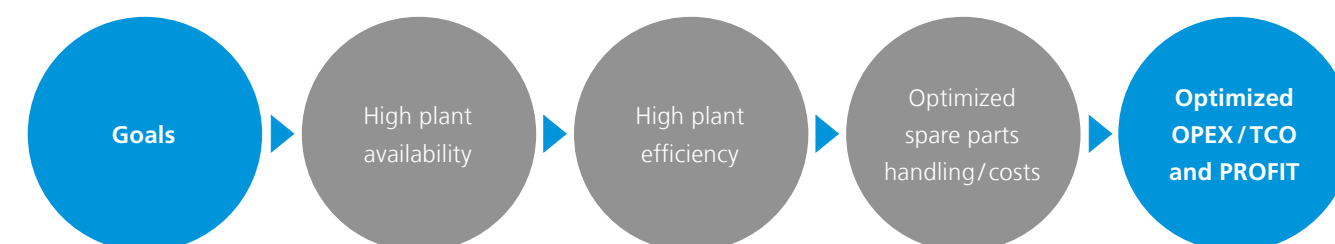
### Energy

- Savings of up to 60 % with an energy storage system retrofit

### Quality

- The hot water produced is used to heat the wort with a plate heat exchanger
- Gentle conditions reduce the thermal stress due to a low interfacial temperature

## Guaranteed top performance





# Service Level Agreements

Together with our customers, we design intelligent solutions aimed at fully exploiting the potential of your brewery and achieving a continuous and cost-effective production process.

Each individual service module plays an important role for:

- Plant availability – Mechanical/Automation
  - Plant efficiency – Process
- = **Cost control – Optimized OPEX!**

Our customers can choose from different service modules to define their own individual service level.

## Service Level Agreements – Mechanical

GEA offers Service Level Agreements for improved reliability, cost control and efficient processes. Scaled to your individual needs: efficient technical support, clearly defined maintenance and service times or a service hotline. In addition, many more modules for mechanical, process and automation service are available.

**Your benefits of mechanical service:**

- Plant safety
- Optimum plant availability
- Cost control (budget security)
- Hotline 24/7
- Emergency service

= **Optimized plant availability!**

## Service Level Agreements – Process

GEA offers Service Level Agreements for improved reliability, cost control and efficient processes.

**Your benefits of process service:**

- Optimized processes generate:
  - High product quality
  - High yield (efficiency), reduced losses
  - High quantity (hl/h)
- Hotline 24/7
- Emergency service

= **Optimized plant availability!**

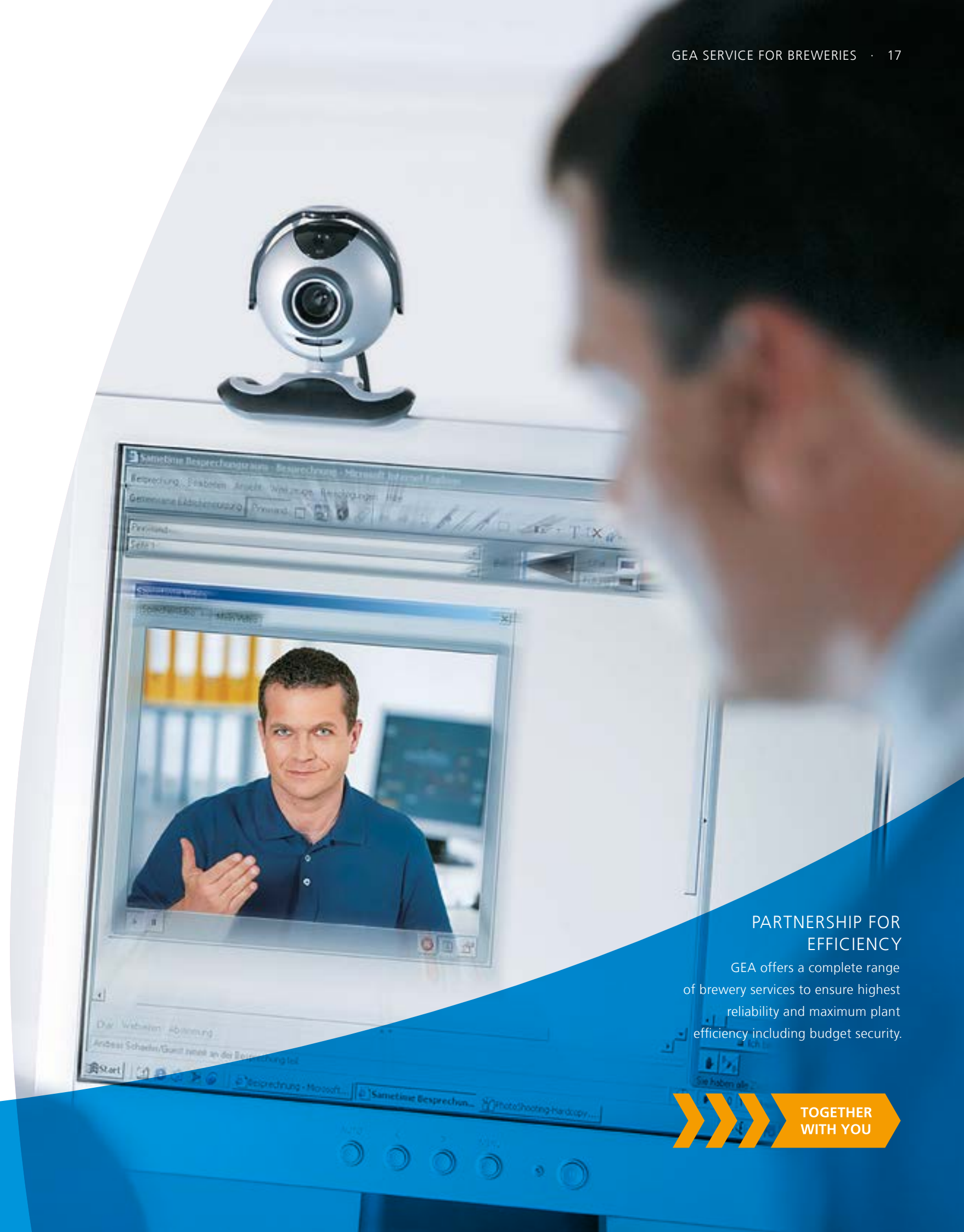
## Service Level Agreements – Automation

GEA offers Service Level Agreements for improved reliability, cost control and efficient processes.

**Your benefits of process automation service:**

- System safety
- Optimum system availability (MTBF/MTBT)
- Optimum service performance (remote service)
- Hotline 24/7
- Emergency service

= **Optimized system performance!**



## PARTNERSHIP FOR EFFICIENCY

GEA offers a complete range of brewery services to ensure highest reliability and maximum plant efficiency including budget security.

TOGETHER  
WITH YOU

# GEA Service for Breweries Worldwide

Wherever you need parts, service or support for the GEA equipment and solutions, our global service network will support you 24/7 globally.



**Service center brewery**

- Warehouse for spare parts of category A, B, C
- Service technician (technics)
- Service technologist (process / energy)
- Service software technician
- Support, consulting, trouble shooting
- Hotline
- Repairs



**Service point**

- Service technicians for certain components
- Repairs



**Representative office**

- Contact for sale of equipment and services

**FACTS & FIGURES:**

**GEA Service for Breweries –  
the results speak for themselves**

- High plant availability
- Excellent system efficiency
- Spare parts availability as required

**= Optimized operating costs (TCO)**





## We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is a global technology company with multi-billion euro sales operations in more than 50 countries. Founded in 1881 the company is one of the largest providers of innovative equipment and process technology. GEA is listed in the STOXX® Europe 600 Index. In addition, the company is included in selected MSCI Global Sustainability Indexes.

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