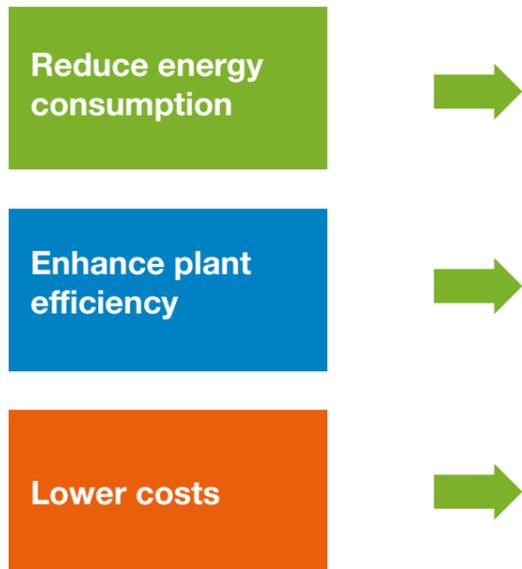


# FIT FOR ENERGY AUDIT



# RETROFIT PAYS OFF.

Targeted partial modernisation of outdated components allows you to kill several birds with a single stone: You can transform a moderately energy efficient plant into an efficient system, thus meeting statutory requirements and simultaneously saving massive costs in this manner. Since 2011, REITZ Retrofit has been highly successful in the support of operating companies looking for a solution to the modernisation of their plant which will pay off in the shortest possible time.



## FIT FOR ENERGY AUDITS ✓

The Energy Services Directive (EDG-G) obliges companies that are not SMEs (i.e. over 250 employees) to conduct an energy audit every 4 years, unless they have already successfully introduced an energy or environmental management system. This aims to achieve an energy saving of around 1.5 % through efficiency measures.

## FIT FOR GREATER EFFICIENCY ✓

Retrofitting measures are not an end in themselves: Systems with variable speed control ensure that the retrofitting of a system with average efficiency usually amortises within 2 years. The enhanced efficiency therefore makes a positive impression on your balance sheet.



# WHAT EXACTLY IS A RETROFIT?

REITZ Retrofit supports system designers and operators who have recognised the need for modernisation, but are still looking for the best solution in terms of effort and costs. A complete renewal is only effective in the rarest of cases. Simple measures, such as the targeted modernisation of individual components, are often sufficient to update a proven system.

## MINOR INTERVENTION, MAJOR EFFECT

There are numerous possibilities to update an outdated system. In principle, we start with an analysis of the actual condition and then propose precise measures for cost-effective and efficient modernisation.

Here are just a few examples of typical retrofit measures:

**Impeller replacement** with the blade design, impeller version and inflow appropriate for the application  
Wear protection on the impeller and housing

**Replacement of fan components** (e.g. bearing, shaft, coupling and belt drive).

**Speed increase** through frequency inverters or belt drives by altering the transmission ratio, provided the dynamic limiting values of the machine are not exceeded.

You will be astonished how quickly a partial modernisation achieved through replacement of outdated control components can pay off. Simply converting to systems with variable speed control can save you up to 30 % in energy and costs.

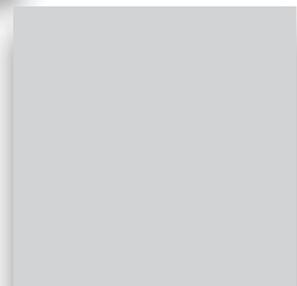


## BEFORE AND AFTER PARTIAL MODERNISATION – AN EXAMPLE

A high-temperature fan before and after partial modernisation. The suction and discharge ducts were also renewed or adapted at the same time.

Repairing or replacing outdated components

Installing new components and enhancing overall efficiency



## MODERNISATION FROM A SINGLE SOURCE

The beginning of each retrofit project involves a careful analysis of the plant based on our knowledge of process engineering integration and control-related dependency. After determining where the focal point for optimisation lies, we take charge of the coordination of all steps. Your plant is brought up to the latest technological standards within a precise time frame and with the fewest possible downtimes. Each REITZ fan is designed to order and is, consequently, optimally adapted to suit your system. We guarantee a system availability of 98 % in this respect.



## ANALYSIS, CONSULTING, IMPLEMENTATION

### Energy audits pursuant to EN 16247-1

Following measurement and analysis, we produce a detailed study which you can draw upon as a basis when estimating the feasibility and savings effects of a modernisation. In addition, we conduct energy audits which, according to the Energy Efficiency Directive (EED), are obligatory at intervals of 4 years for companies which do not have an energy management system pursuant to ISO 50001.

### Needs analysis

Flow conditions in a system are simulated and analysed using computational fluid dynamics (CFD). This enables the illustration of optimising potential, both in aerodynamic and aero-acoustic terms. Strengths of rotors and the behaviour of rotordynamic systems under operating conditions are simulated and optimised with the aid of a structure-mechanical analysis (FEM).

### System planning

Conversion, calculation, planning, realisation.

### Dismantling and installation

Professional installation services within a precise time frame. Planning, realisation, management, including with sub-contractors.

### Commissioning

of converted machinery and system components.

### Control technology, e-technology, acoustic technology

Explanation of interfaces to the control and instrumentation system, integration of new controls (e.g. when retrofitting for variable speed control), integration in low or medium-voltage switchgear systems, innovative sound insulation solutions to adhere to relevant standards.

### Monitoring and maintenance

These range from simple systems with signalling to process control technology to online condition monitoring which enables timely initiation of maintenance measures. Regular maintenance deadlines and individually tailored maintenance contracts.

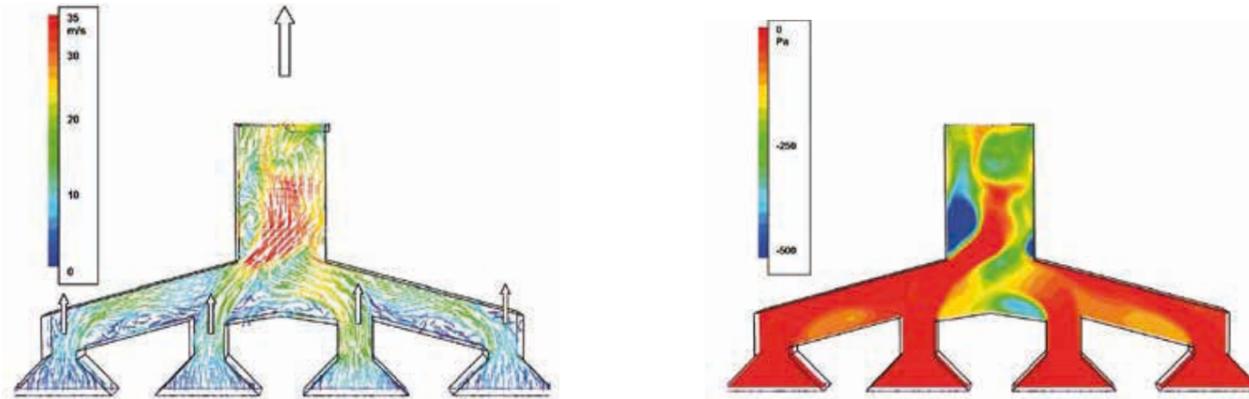
# PRECISE ANALYSIS IS THE BASIS

The beginning of each retrofit project involves a careful analysis of the plant based on our knowledge of process engineering integration and control-related dependencies. Following a personal assessment of the system, our engineers have the latest analytical processes at their disposal to identify weak points and develop efficient solutions.

## IDENTIFYING AND OPTIMISING FLOW SITUATIONS WITH CFD.

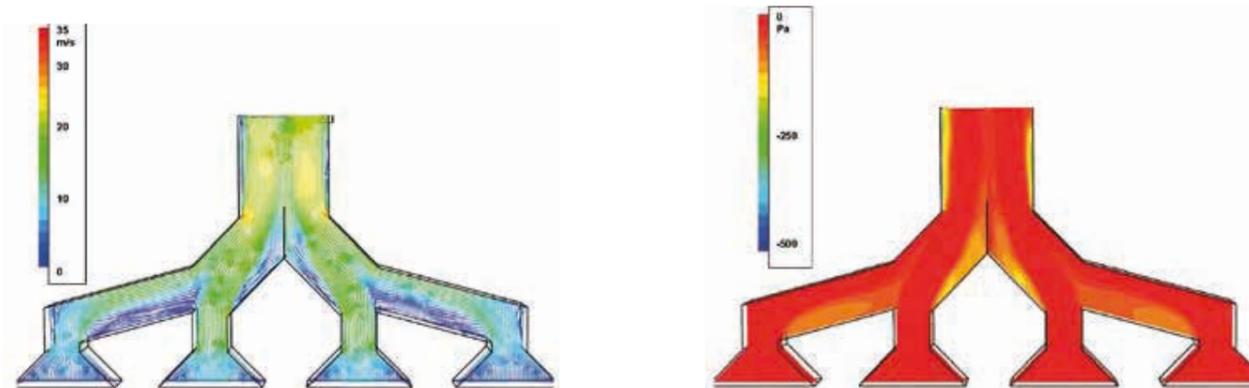
Modernisation solutions which only involve low investment costs but achieve major effects can frequently be developed on the basis of a precise knowledge of flow conditions in ventilation systems. For example, the targeted introduction of guide elements in the flow ducts can often influence the flow control so that the pressure loss in it is drastically reduced.

### BEFORE



Actual condition of system: not exactly the best. Massive flow separations lead to a considerable pressure loss.

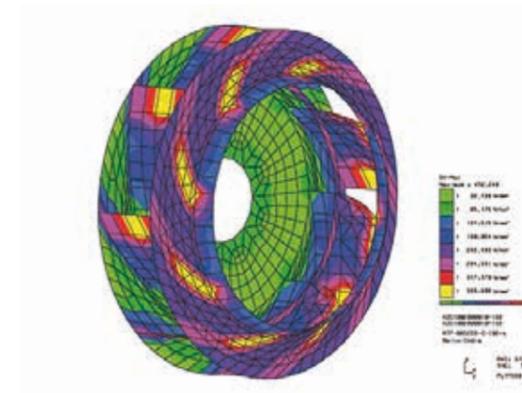
### AFTER



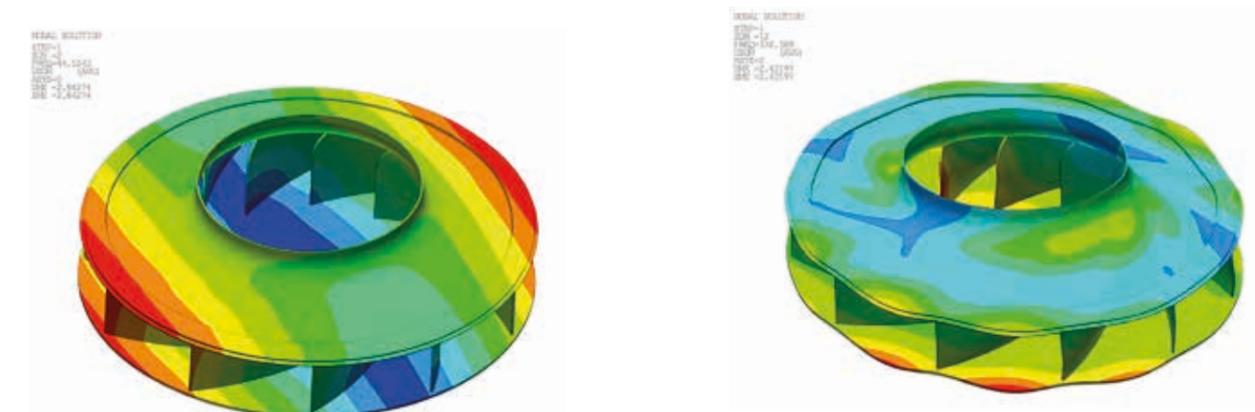
Target condition: Homogeneous flow distribution is the prerequisite for increased productivity and the efficiency of the entire system.

## ILLUSTRATING THE STATIC AND DYNAMIC BEHAVIOUR OF ROTORS WITH FEM.

The finite element method (FEM) allows us to analyse and evaluate the static and dynamic behaviour of components under the most varied conditions. This procedure provides us with the certainty we need to ensure that not only each component itself is correctly configured, but most importantly optimised in interaction with the entire plant.



FEM analysis of an impeller



Examination of rotor dynamics through modal analysis.

## REITZ RETROFIT INNOVATIONS

We are professionally involved with optimising and modernisation solutions on a daily basis. As passionate engineers and technicians, we have the expertise to identify the options which proven techniques and processes harbour for new application areas. Our gasproof and pressure-resistant fans for high-pressure applications are a good example of how specialised products can be used with great success for new applications (e.g. calibration of gas meters).

### SPECIAL FANS FOR CALIBRATION OF GAS METERS

Due to their specific quality, special fans have proven their value as alternatives in areas of application in which until now they have hardly been taken into consideration. For example, the MEE high-pressure fan sets new standards with regard to precision and efficiency in processes as a calibrated solution in gas testing systems. Thanks to a pressure resistant housing and integrated motor, this special design unites all components in a single housing without complicated and expensive sealing systems.



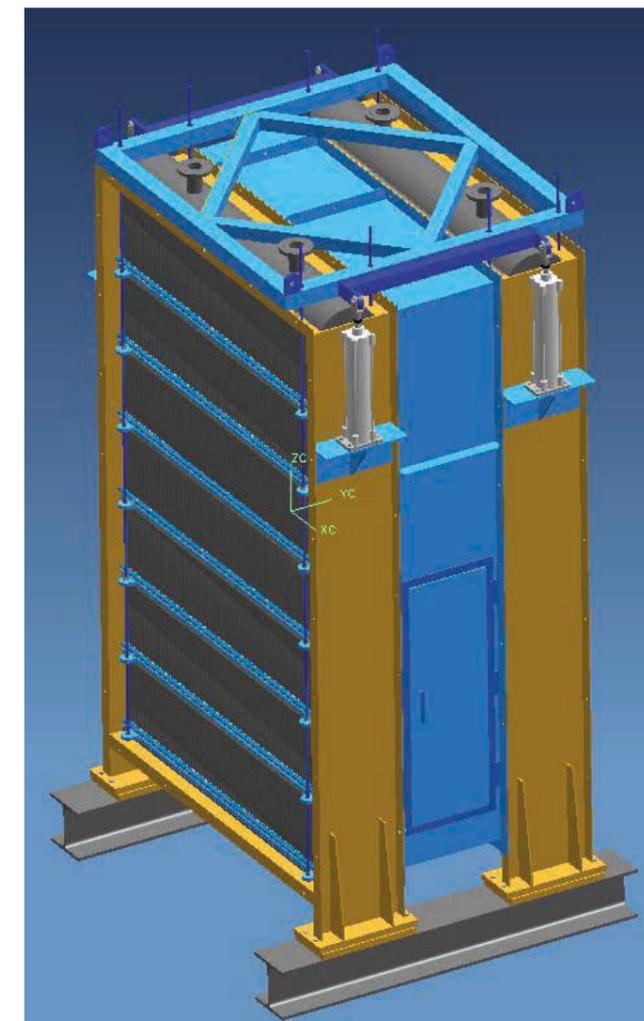
### CLEVER USE OF ENERGY: DRYING PLANTS

Heat generated during the operation of a biogas plant is used to dry wood chips and any type of grain or other products. Heat recovery is realised through a heat exchanger downstream of the fan. The flow can be adapted to the product involved using a frequency inverter.



### REDUCING THE EFFORT AND COSTS: AIR PREHEATER CLEANING UNIT.

This mechanical cleaning unit was developed by REITZ Retrofit to detach fibrous, matted dust particles during operation that adhere to the hot pipes of the air preheater. This avoids an increase in flow resistance. The advantage: The waste-fired boiler need not be operated with oil to clean the air preheater. Cleaning, oil operation and downtimes are avoided.



# PLANT ENGINEERING FROM A TO Z.

In addition to the modernisation and conversion of fans, we offer you a broad range of services which address your ventilation system and, indeed, go much further. System planning, steel structures, stacks, complete designs, mechanical cleaning systems and special machines are all part of our broad delivery spectrum.



## THE PERFECT SOLUTION FOR EVERY CASE

**Renewal of pipe and duct systems, sound insulation booths, waste air lines, stacks and much more.**

**Setup of transport systems for the rapid replacement of units and blowers.**

The embedded rail system enables replacement of the fan with an identical model within the shortest possible time. This facilitates the smooth replacement of a fan without any complex dismantling or installation work.

**Modernisation and new deliveries of ash removal and purging systems**

We will, of course, realise all these tasks at the best possible conditions for you and with the reliability typical of REITZ Retrofit, coordinating all disciplines and even taking care of commissioning and maintenance and guaranteeing an availability of 98% within the first two years.



Example of REITZ Retrofit plant engineering competence: Modernisation of a stack and pipe systems



Example of REITZ Retrofit plant engineering competence: Transport system for rapid replacement



Example of REITZ Retrofit plant engineering competence: Foundation planning and construction



Example of REITZ Retrofit plant engineering competence: High-pressure blower in China

## EXAMPLES AND REFERENCES

We are an independent retrofit service provider. We aim to enhance the productivity and energy efficiency of plants through individual modernisation concepts. With the experience and technological know-how of the REITZ Group behind us, our strength lies in reliable consulting and single-source implementation. The following is a small selection of modernisation projects successfully delivered on schedule. We're looking forward to your challenge!



**Bayer Dormagen:** engineering, delivery, installation, commissioning of two radial fans (one reserve fan) and required foundation installations, including transport system



**Cemex Zement:** complete exhaust air system with fan, engineering, production, delivery and installation of an exhaust air line with diameter 500 incl. insulation



**RWE power station Lingen:** delivery, installation, commissioning of 4 fans



**Badische Stahlwerke Kehl:** production and installation of all duct work, including steel and standard installations, delivery and installation of induced draught and fresh air blowers



**ZAS Burgkirchen:** engineering, production, delivery, dismantling and installation, replacement of fan



**Granotec:** replacement of 2 KXE fans, dismantling and installation, conversion from inlet vane to variable speed control



**SWB, MVA Bonn:** retrofiting of 6 existing draught blowers including retrofiting of existing fans from inlet vane to variable speed control



**IWV-Ilmenauer Wärmeversorgung:** integration of a duct incl. fan in an existing system using a bypass duct and shut-off dampers

**AND WHEN SHOULD WE MAKE YOUR SYSTEM (RETRO)FIT FOR THE FUTURE?**

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