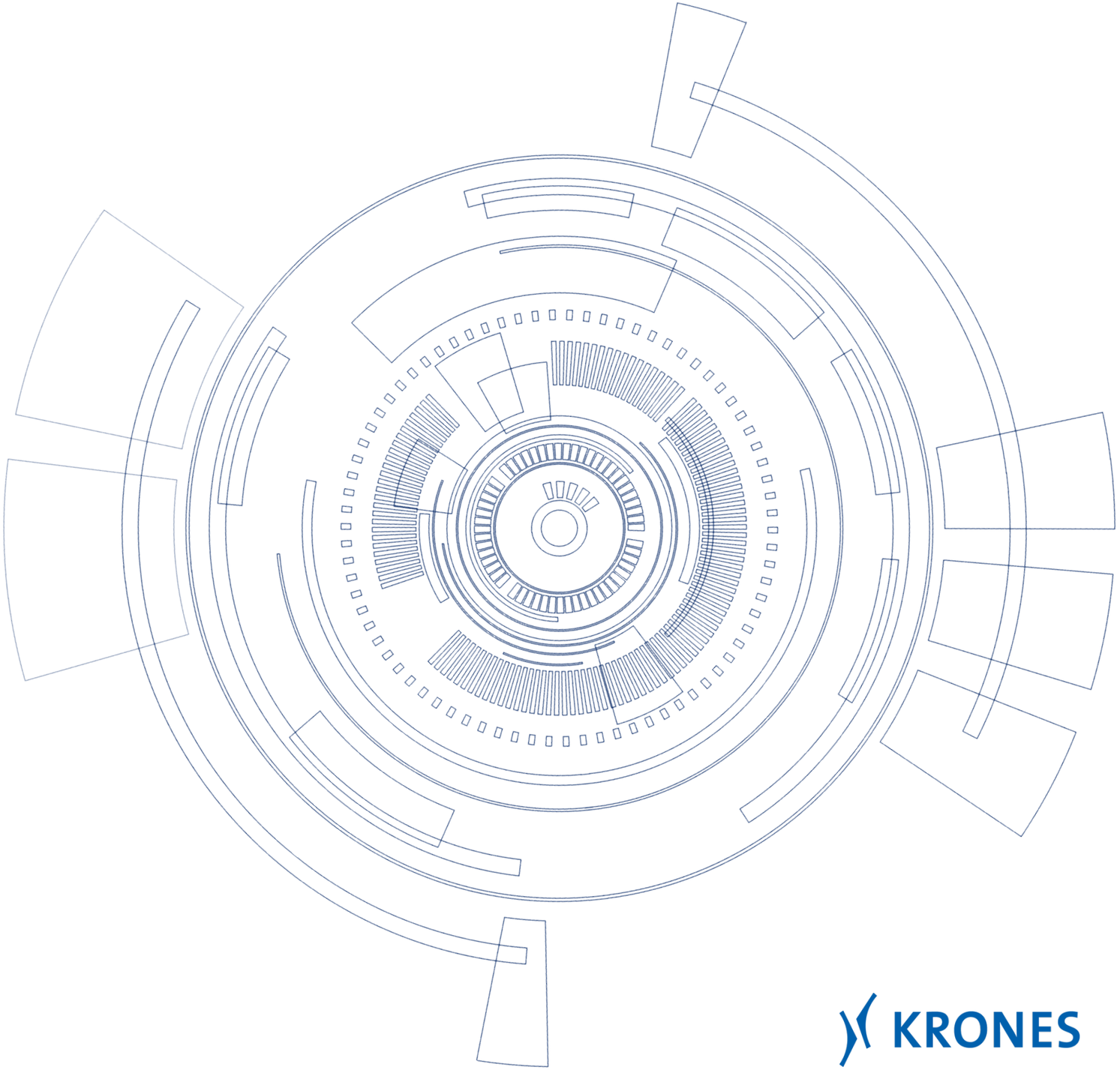
STEINECKER Low-temperature brewery

Energy supply in breweries of the future



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The low-temperature brewery according to KRONES

Energy-efficiency in the brewery not only reduces the operating costs but it also protects the environment. Steam as a heat transfer medium in modern plants has served its time, because high system losses had to be accepted for the provision of energy. Boiler plants for high-pressure water supply was already the first step in the right direction to reduce the losses.

However, the STEINECKER concept of a low-temperature brewery is the advancement of a hot-water system with a significantly reduced temperature level in favour of a minimised CO_2 footprint of a brewery.

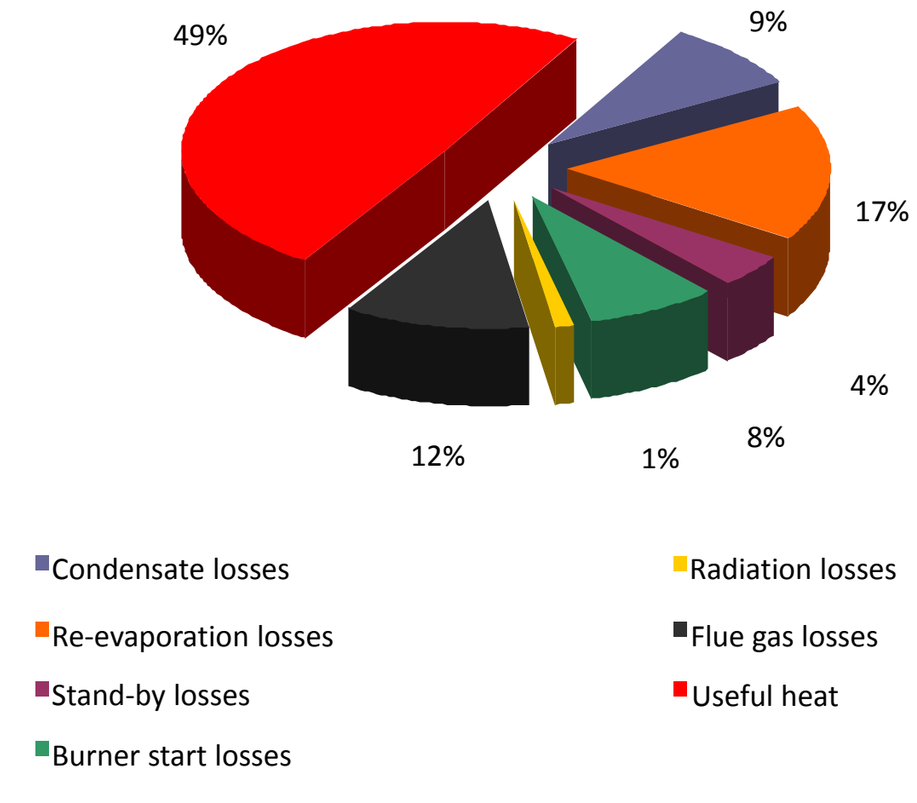
At a glance

- Use of hot water of up to 115 °C as a heat transfer medium in a closed system
- Energy provision via a central energy storage tank
- Multiple use of thermal energy
- Easy integration of energy recovery
- Central energy system also for renewable energy

Basis for the low-temperature concept with energy storage unit

- Steam systems cause high distribution, condensate and re-evaporation losses. In the field, fuel losses of up to 50% can occur.
- Most processes in a brewery run at a temperature below 100 °C.
- Lower heating agent temperatures reduce delivery, radiation and system losses.
- Special stratified energy storage tanks avoid consumption peaks due to overlapping heat consumers.

Energy loss and useful heat of a steam boiler



Steps to the development of a sustainable brewing process

1 Reduction of consumption	2 Recycling of residues	3 Alternative supply
– Saving energy – Energy consulting – Energy recovery – Reduced temperature level – Highest gravity – National energy standards – Implementation of ISO 50001	– Waste water recycling – Biogas production – Thermal utilisation – (spent grains, labels...)	– District heat connection – External biomass – Sun – Wind – Water – Geothermal energy
Saving = 30 … 50%	**Ø CO_2 red. = 30 … 50%**	**Ø CO_2 red. = 0 … 100%**

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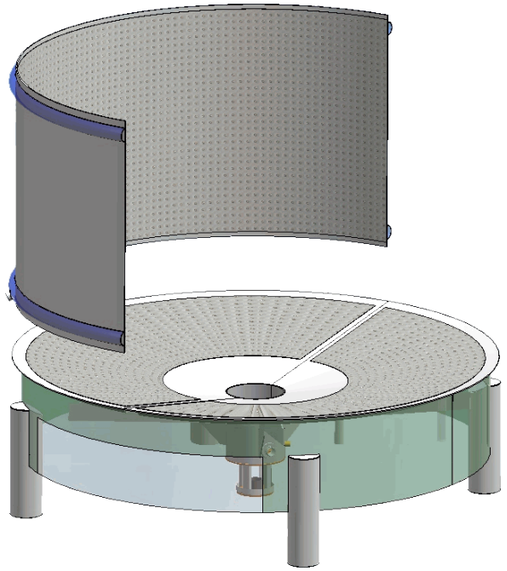
Highly-efficient heat transfer devices optimise heat utilisation

Characteristics of an optimal heat transfer

- Minimum thermal resistances
- Maximum heat transfer coefficients
- Maximum use of space
- Pillow plate technology with counterflow heat exchanger principle



Heat flow

$$\dot{Q} = k \cdot A \cdot \Delta\vartheta = [W]$$

Heat transfer coefficient | Heating surface | Driving force

The result

In the brewing process, no heating media temperatures exceeding 115 °C are required.

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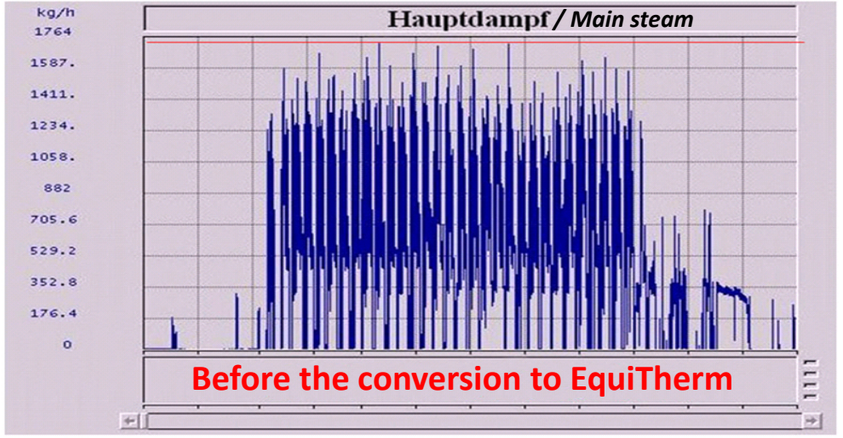
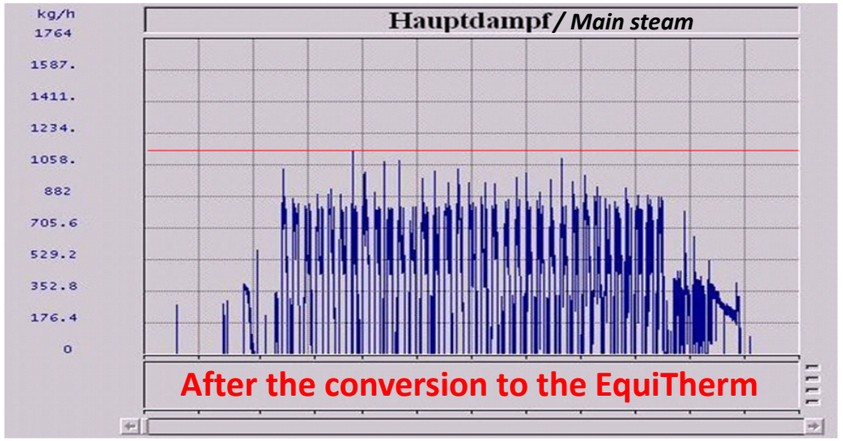
EquiTherm: energy recovery for top efficiency – not only in the brewhouse

The EquiTherm energy recovery system can be optimally integrated in the low-temperature brewery since both system are based on a central energy storage tank.

- Mash and wort is heated with energy recovered from vapours and from the 1st wort cooler stage.
- With EquiTherm, boiling in the brewhouse is the sole primary energy consumer.





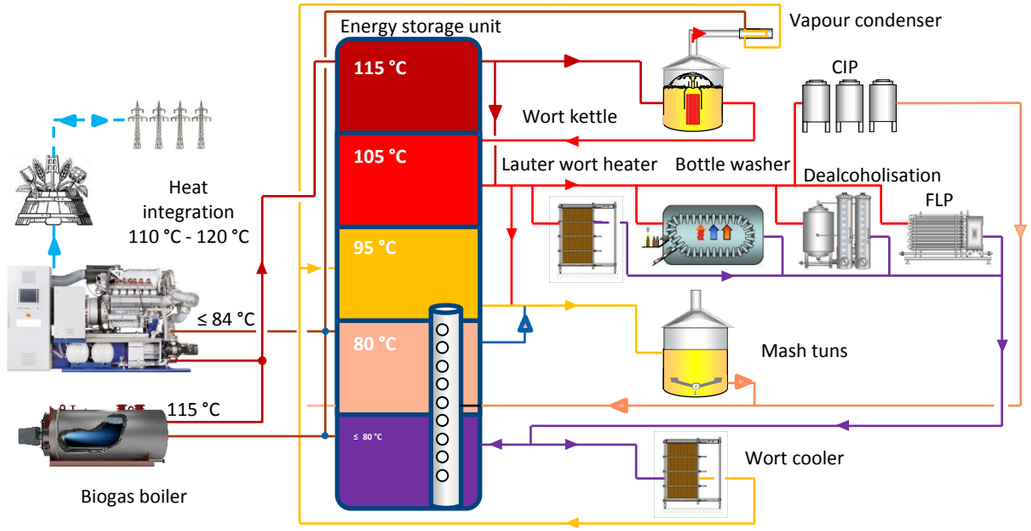
Benefits to you

- Little or no fouling
- Reduction in primary energy requirement
- Reduction in peak loads at the boiler
- Reduction in the connected electrical load
- Smaller design of the boilers
- Removal of excessive warm water

A central energy storage tank as an interface for all processes

Multifunctional buffer energy storage tank

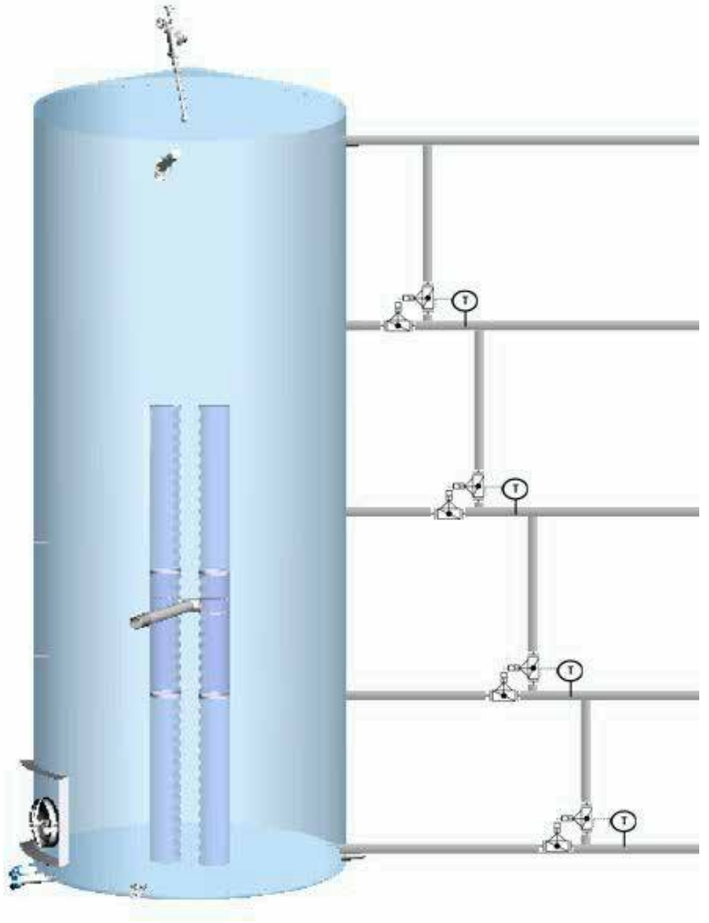
- An energy storage tank integrates all users.
- The peak loads in the brewing process are buffered via the energy storage tank.
- The option for consistent loading also facilitates the connection to a combined heat and power unit (CHP).
- Alternative sources of energy can be easily made accessible and used for the preparation of hot water.



Optimum use of heat capacity via cascade connection

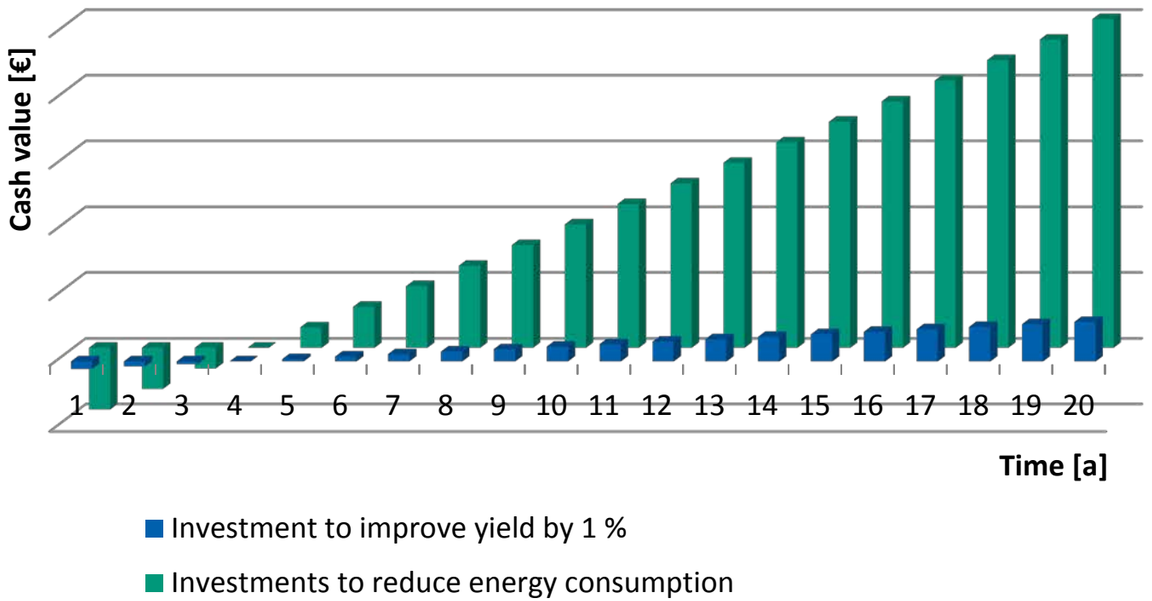
The energy storage tank enables a customised efficient use of heat.

- There are four process-based temperature levels for supplying the consumers in a brewery.
- With the cascade connection, the pre-run temperatures to the consumers can be individually and variably adjusted.
- The stratified charging pipe allows for an optimised supply or removal of energy.
- The heating medium can be used step by step in multiple use.



The facts at a glance

Low temperature combines economy and ecology
Thanks to the measurement of the current energy and media flows, the optimisation potential can be analysed in order to create concepts for an environmentally friendly brewing process.
In the long term, investments in the energy supply technology will result in a significantly higher return on investment than investments in an increased extract yield.



Benefits to you

Optimal utilisation of the available thermal energy

The intelligent control system supports the continuous loading and emptying of the energy storage tank with a high capacity factor at the same time.

Integration of different energy sources

The system with energy storage tank enables the inclusion of a CHP, solar thermal system or the combination of different heat generation systems to cover the basic or total load.

No peak loads at the boiler plant

The central energy storage tank enables a consistent loading and therefore the smallest possible boiler capacities.

Brewing beer with low energy consumption

The use of the EquiTherm system and the low-temperature concept for the heat supply of the brewing process is the key to the most-saving brewery with an energy consumption of < 19 kWh per hectolitre of beer.

Digitalisation

Process technology

Bottling and packaging equipment

Intralogistics

Lifecycle Service

We do more.

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