



Krones Plants

Energy and sustainability consulting



Energy and sustainability consulting Team



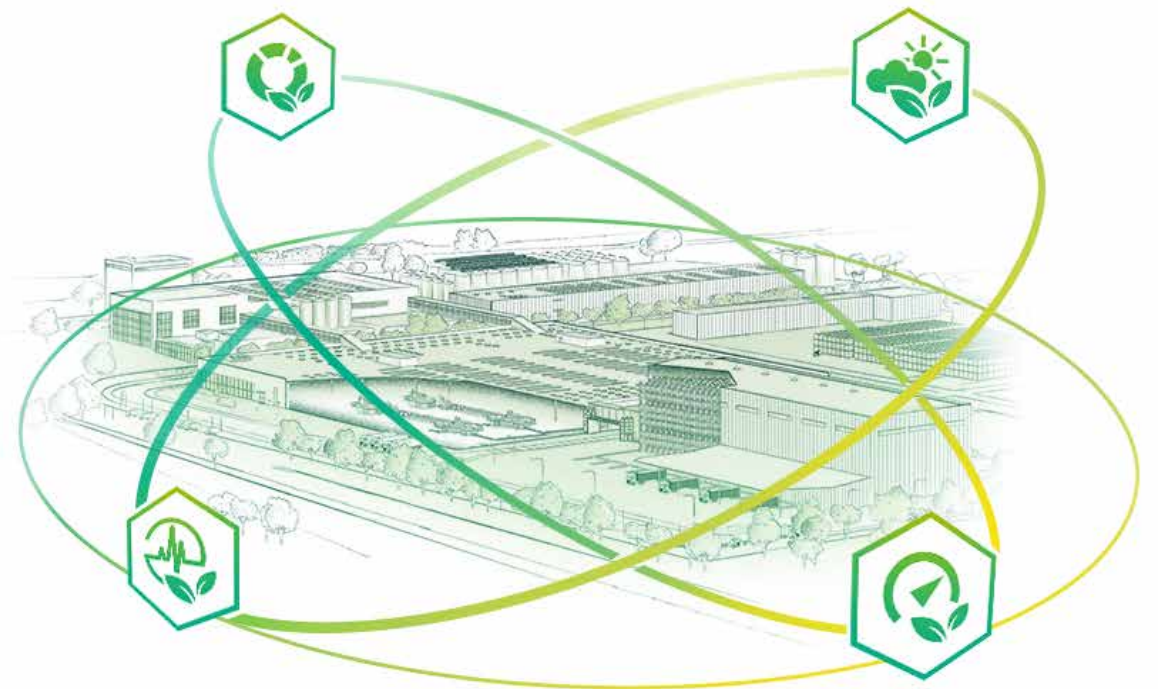
Whether in a new production plant or an existing factory: our consulting team within **Krones Plant Engineering** guarantees you comprehensive and competent support in the achievement of your sustainability goals.

Our team combines all of the necessary core expertise to develop **sustainable** and **effective solutions** for you. With our holistic and **inter-factory approach**, we always act on the principles of:

Avoid Optimise Recycling.

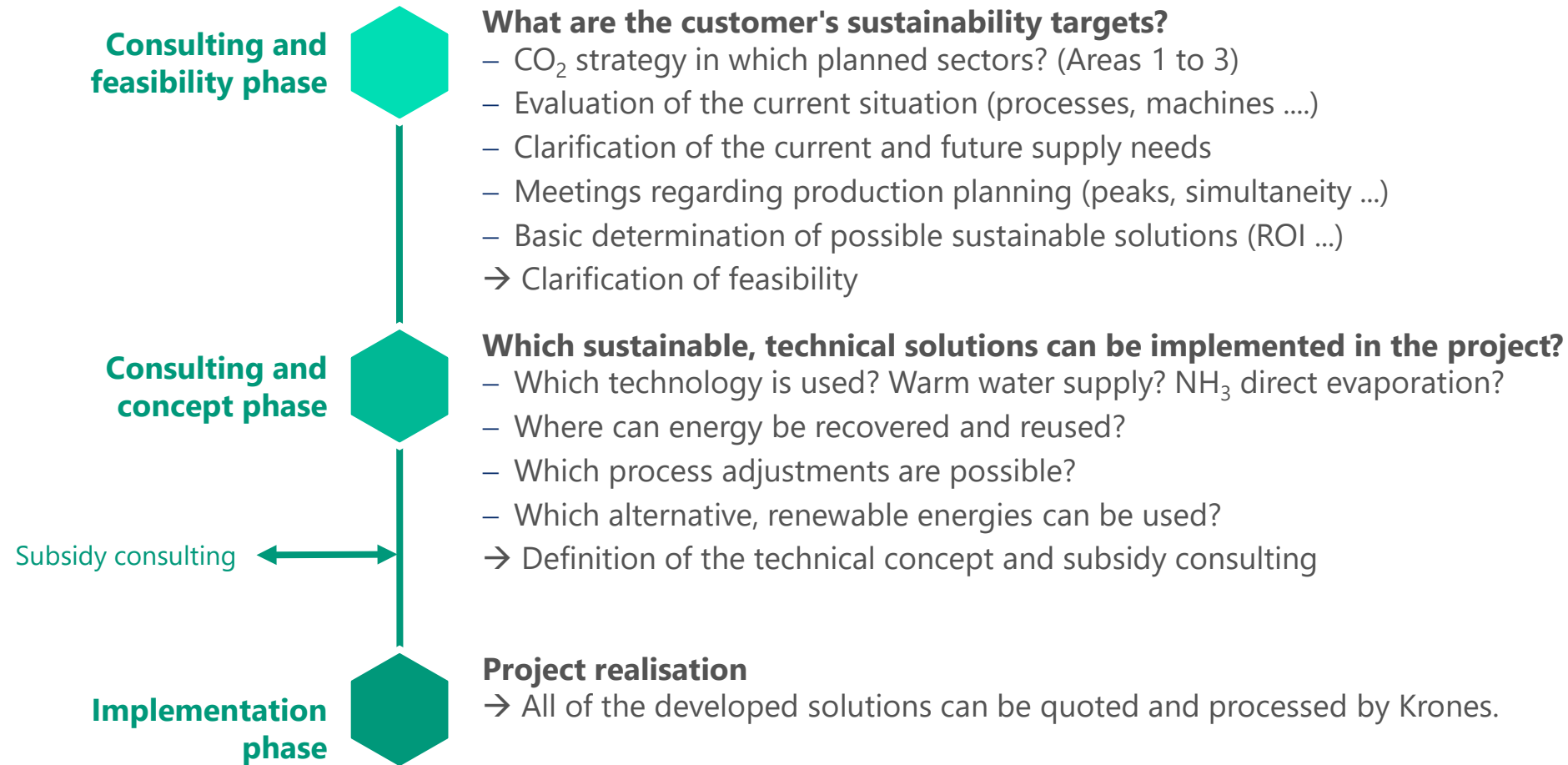
Our aim is to **reduce operating costs, increase sustainability** and lower the **CO₂ footprint**.

Our consulting approach allows us to decipher your individual needs at an early stage. This ensures that we can develop sustainable solutions for you in a targeted manner – and this prior to the quotation process, so that you can receive the corresponding subsidies, among other things.



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Sequence



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Strategies for decarbonation



The climate crisis is one of the greatest challenges of our time. This is why the EU has set itself the target of becoming the first climate-neutral continent by 2050. Achieving climate neutrality should therefore become increasingly important for companies in the beverage industry.

To develop a clear vision and the main focal points of our decarbonation strategy for you, we collaborate with you to clarify the following questions at the beginning of the sustainability consultation:

- Should **climate neutrality be reached**, i. e. a condition in which there is no impact on the climate?
- Or are **zero emissions** the target, meaning a zero-sum balance when it comes to CO₂ emissions?
- Do you aim to achieve complete or partial **energy self-sufficiency**?
- Or do you have possible goals in-between?
- And for which areas or scopes does this target apply?



Sustainability analyses



Source sinks, Sankey and PINCH analyses are used to calculate the potential for the energy-related use of untapped heat currents and thus reveal possible energetic process optimisations.

Our services increase your value:

- Information about unused heat currents (losses, waste heat, reduction, regenerative sources)
- Knowledge about the efficiency of systems and production processes
- Overview of potential energy recovery systems

Derived from the calculated potential, you receive a plan of a recommended course of action for improving the line efficiency. You can use it to lower your primary energy consumption and thus save operator costs.



Supply technology audits



In on-site audits with PLC data loggers, as well as clamp-on and inline measurements, our team analyses the technical condition of your supply units and discovers opportunities for optimisation.

Our services increase your value:

- Transparency for own consumption
- Overview of power quantities
- Information regarding efficiency
- Potential for production plan optimisation to achieve a more efficient management of the supply unit.

Derived from the analysed measurement results, you receive a plan of a recommended course of action for improving your supply technology units. You can use it to lower your primary energy consumption and thus save operator costs.



Concepts for energy and media



We develop a holistic energy and media concept in line with your **sustainability targets**. To do so, we unite **Krones expertise** from the various spheres of activity and combine them to form individual solution approaches. The basis for each concept is the recording and analysis of all product-relevant data and influencing factors.

Based on our “avoid, optimise, recycle” approach, you receive:

- Transparency regarding energy and media consumptions
- Information about potential areas for energy recovery and process combinations,
- Alternatives to supply and disposal technologies
- And options for utilising renewable raw materials and storage capacities

A comprehensive concluding report explains the conceptually developed energy and media savings. If successfully implemented, it will allow you to save primary energy and operating costs and thus lower your CO₂ footprint.



Sustainable producing



Thanks to an optimised production plan, as well as a resource-saving installation and capacity plan, our experts already lay the foundations for sustainable and energy-efficient production right from the beginning of the project.

Our services increase your value:

- Knowledge about the efficiency of systems and production processes
- Intelligent intralogistics with short routes
- Increase in Overall Equipment Effectiveness (OEE)
- Support in investment decisions regarding machines and systems

The calculated potential is then used as a basis for deciding on a recommended course of action for the optimum operation of your production system. As a result, you can lower your primary energy consumption and make a sustainable investment decision.



Sustainable equipment



Our experts prepare a technology comparison based on previously defined evaluation criteria. Krones machines and systems that have been officially awarded the **enviro** seal for **outstanding ecological efficiency** can be compared as a reference. The technical requirements are defined by the EME standard that has been developed by the TÜV SÜD (technical inspection authority) for assessing production plants.

Our services increase your value:

- Transparency about the efficiency of the utilised components
- Overview of energy and media consumptions
- Potential for recycling and reuse
- Illustration of the investment and operating costs of the considered machines and systems

You can make a decision regarding which technology is best with the aid of this evaluation. This will allow you to design your beverage manufacturing process with increased sustainability.



Sustainable packing



Sustainable product containers and product packaging do without environmentally damaging content while remaining sturdy and resilient and can still be recycled better than conventional container and packaging materials.

Our Krones in-house experts who focus on recycling, product containers and product packaging are only too pleased to advise you and find just the right sustainable solution for you.

Our services increase your value:

- Material analysis and classification
- Advice on and construction of recycling systems for PET, PO and PS
- Design and advice regarding sustainable containers
- Sustainable packers

Such consulting services provide you with the opportunity to complete your recycling circuit (bottle-to-bottle). You can also save on additional operating costs through material-efficient packaging.



Sustainable supply technology



By keeping in mind the three Krones principles of sustainability, “avoid, optimise, recycle”, our experts develop a sustainable supply technology that covers your energy and media requirements. This technology ranges from renewable energies, heat pumps and combined heat and power units through to consumption-optimised utilities (steam, cold, compressed air, CO₂ etc.)

Our services increase your value:

- Overview of energy savings through renewable energies, photovoltaic systems and solar energy
- Development of comprehensive refrigeration/heat supplies using heat pumps and accumulator technology
- Current and heat-regulated combined heat and power units
- Consumption optimised utilities

Derived from supply concepts, you can save primary energy and operating costs.



Water management



Our experts develop system solutions for the reuse of fresh and waste water for beverage and recycling factories, thus allowing you to recycle up to 80 percent of the water you consume.

Our services increase your value:

- Transparency in how your water is consumed
- Overview of waste-water quantities and qualities
- Potential for saving water and generating energy from waste-water treatment

Based on these concepts, you are then provided with suggestions on how to reduce your water consumption and achieve further potential energy savings. You can thus save fresh water and primary energy in the long term and, as a result, lower your operator costs.



Biological use



Sustainable raw materials and organic waste materials resulting from food production represent an area with high potential for the sustainable supply and disposal chain in beverage plants. Additional high-quality, circular-economy materials can also be generated from biogenic production waste, such as spent grains.

Our services increase your value:

- Illustration of options for saving on and replacing fossil fuels (electricity, heat and fuel) using biomass/biogas
- Reduction of greenhouse gas emissions
- Contribution to achieving possible energy self-sufficiency
- Opening up of additional, new sales channels (protein and fertiliser manufacture)

Biological use supports you in utilising any potential for energy savings and emission reductions while additionally reducing your CO₂ footprint.



Sustainable investment



When developing the technical and sustainable solutions, the financial framework conditions are also taken into account. The focus lies here on KPI and TCO analysis, as well as providing advice on possible means of financial support.

Our services increase your value:

- Illustration of relevant key performance indicators (e.g. kWh/hl)
- Listing of all investment and operating costs
- Information regarding your return on investment
- Overview of financial assistance available

This assignment package allows you to make a well-informed decision regarding the best technical and economic solutions.



Energy management system



With this assignment package, we then support you with advice from the first individual measuring concept through to the implementation of an energy and management system in accordance with DIN EN ISO 50001 and the final certification.

Our services increase your value:

- Selection of relevant and optimum measuring points
- Transparency regarding energy and media consumptions
- Individually developed MES analyses and reports
- Support in the implementation of an energy management system
- Certification from selected partners

This advisory service makes it possible for you to record your energy and media consumptions, thus making it possible for you to identify and provide proof of detailed analyses and subsequent saving measures.



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