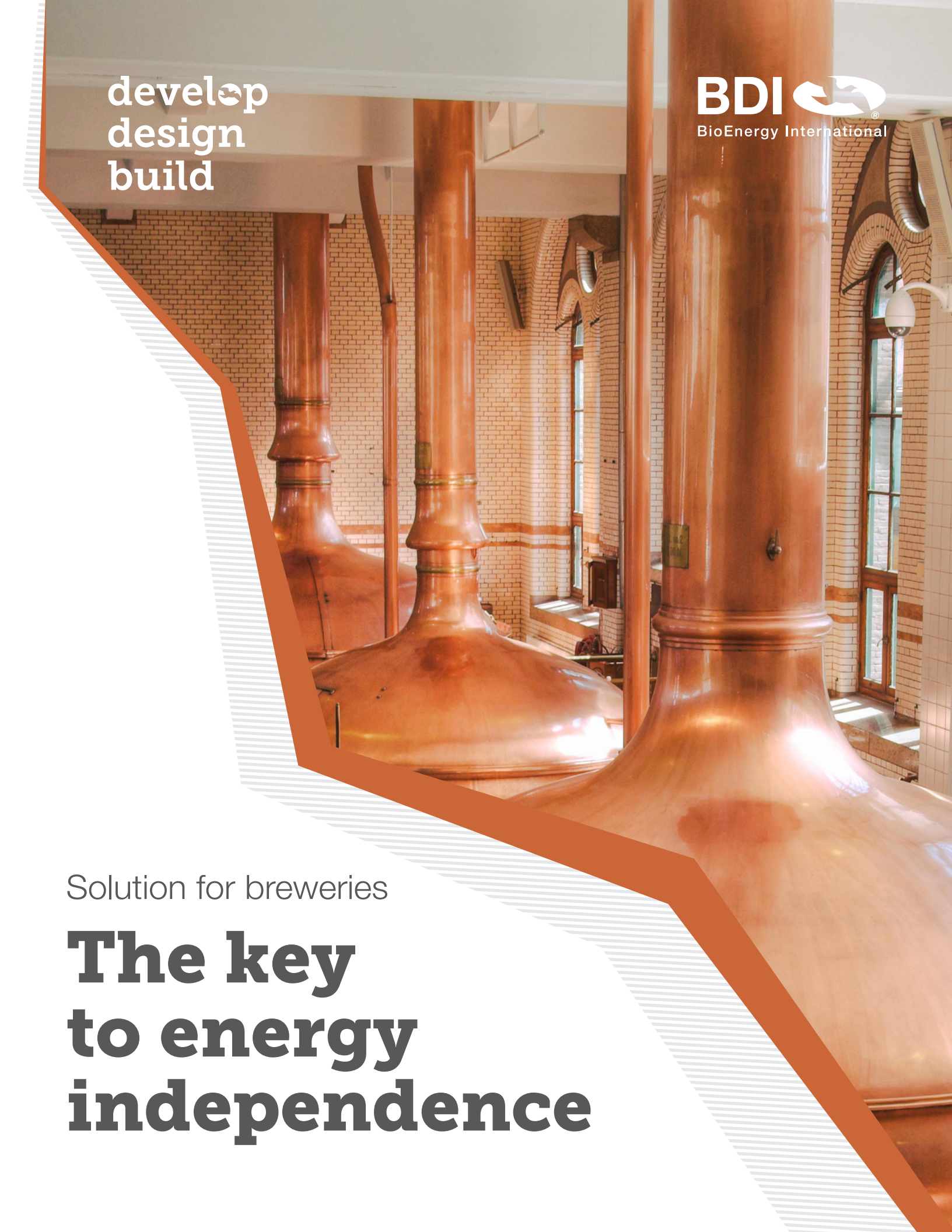
develop
design
build

BDI
BioEnergy International



Solution for breweries

The key to energy independence

The unique BDI BioGas technology is designed for industrial applications, enabling breweries to achieve the goals of carbon neutrality and energy autonomy. Compact in size, the system uses spent grain and yeast as a substrate. A reliable, stable anaerobe digestion process allows an industrial BioGas production that stands out thanks to its high level of profitability and sustainability.

Brewery process

The process of brewing beer has a history that goes back thousands of years, which is why breweries are a well-developed part of the food and beverage industry. The raw ingredients hop, malt and water are converted to beer and several by-products, such as spent grain and surplus yeast. Spent grain is often used as animal feed or in other food industries, while surplus yeast is either used in agriculture or is disposed of. Waste water generated in the brewery process has to be cleaned before it is discharged into a sewer or a river.

Environmental challenge

The use of renewable energy sources during the brewing process is the key to reducing greenhouse gases and increasing sustainability. The BDI BioGas technology, by converting brewery residues into a variety of green energy sources, is the most suitable solution for this concept. With this technology breweries take the most important step towards energy self-sufficiency by generating green electricity, biomethane and sustainably produced steam and hot water, while significantly reducing operational costs at the same time.

Potential

Almost two billion hectoliters of beer are produced globally each year. The main brewery residues – spent grain and surplus yeast – add up to 20 kg per hectoliter of beer. On top of that, approx. 4 kg of waste water are generated. Based on the brewery's specific energy demands of approximately 12.5 kWh heat and 8 kWh electricity per hectoliter of beer, the anaerobic digestion of brewery residues can cover as much as 100% of the heat energy or electricity demands that would have otherwise been generated by fossil fuels.

Process description

Spent grain is mixed with recycled digestate from the biogas plant. This slurry is then pumped to the hydrolysis tank, which constitutes the first stage of the anaerobic system. Surplus yeast can also be added. In the downstream fermenter and post-fermenter tanks, perfect process conditions and an optimized plant design lead to a maximum conversion of carbon and hydrogen into biogas. The biogas produced contains up to 60% methane, ideal for use in gas engines for the production of power and heat or alternatively for burning in a boiler to produce steam. Thanks to the BDI process, the remaining digestate is used as a certified organic fertilizer for agriculture and contains all the valuable nutrients found in brewery residues.

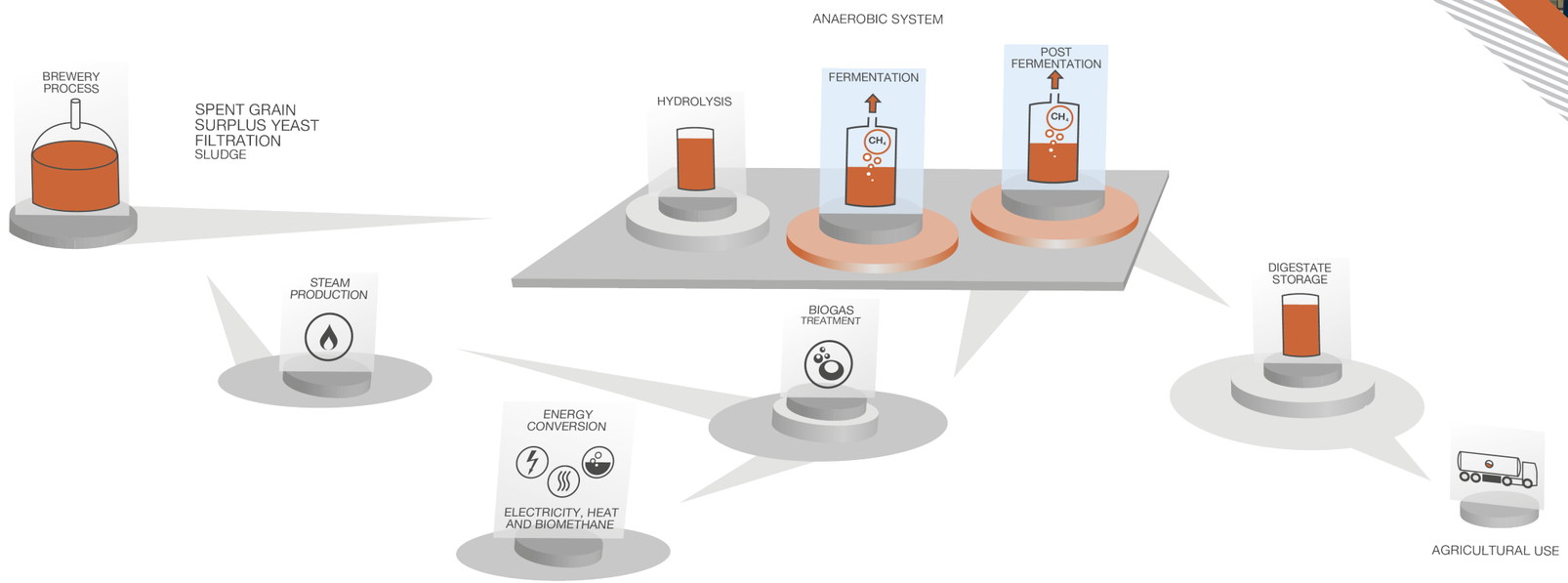
Customer benefit

With the robust and reliable BDI BioGas plant, all organic residues from the brewery can be converted to valuable assets, thus eliminating the need for disposal and replacing costly conventional energy with cheap, self-generated energy. This not only results in reduced operational costs and an increased resilience against external risks, but also in a significant contribution to the environment. With this technology, customers can make the brewery greener, energy-independent and – at the same time – help achieve carbon neutrality.

BDI BioGas technology

- Maximum yield up to 95%
- Biogas as a service package – BUILD OPERATE TRANSFER (BOT) model
- 8 years of operational experience with industrial brewery spent grain plant
- >25 years of experience in full integration and tailor-made plant layout and process

Schematic diagram of a biogas plant for breweries



12 months to net zero CO_2

Pre-engineering

evaluation of different energy supply models

Authority engineering

support for permission

Procurement

purchase of equipment and services

Installation

modular system, fast on-site assembling

Plant in operation

comissioning and full service

Target

net zero CO_2

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