

Brewing Energy saving pilot for an innoVative, Efficient, and enviRonmental beverAGE process





THE LIFE PROGRAM is the EU's financial instrument supporting environmental, nature conservation and climate action projects throughout the EU. The general objective of LIFE is to contribute to the implementation, updating and development of EU environmental and climate policy and legislation by co-financing projects with European added value. Since 1992, LIFE has co-financed some 4306 projects, contributing approximately € 3.4 billion to the protection of the environment and the climate.

BEVERAGE



In 2016, AB-InBev has been granted approximately € 800 000 for the LIFE BEVERAGE PROJECT

that is part of our ambitious dream to create a cleaner world. These LIFE programs contribute to the achievement of the objectives of the Europe 2020 strategy and embed sustainability and social responsibility throughout our entire value chain.



The boiling step is the most energy consuming step in the brewing process, which consumes up to 20 % of the total heat required and generating high levels of greenhouse gases. Previous research at AB-InBev led to the publishing of the **patented technology** of "Method for treating a wort in a boiling kettle". Fuel and water consumption can be drastically reduced in this process step by a disruptive innovation; using atmospheric air as the ultimate green resource. Bubbling nitrogen gas into the liquid will simulate the effect of boiling, without the heat requirements.



As the world's leading brewer, AB-InBev has an important role to fulfill in addressing serious environmental changes such as water scarcity, resource depletion and climate change. With the **LIFE BEVERAGE** project we aim to reduce the emission of greenhouse gases caused by beverage production through a new process technology that will be piloted at breweries in Belgium and UK. We are passionate about our brewing traditions, but understand that traditional brewing processes often stand at the gateway to transformational change. The fundamental principles of the most energy consuming step in the brewing process are being questioned and carefully re-verse engineered. In this way AB-InBev aims to:

Lead the way in the transition towards a new standard for a more environmental friendly and **sustainable brewing process**. Future growth must be maintained, while simultaneously reducing the costs, energy consumption and greenhouse gases emission.

Develop LIFE BEVERAGE technologies for two **different production methods** piloting in Jupille and Magor breweries to enable roll-out to all AB-InBev breweries worldwide, which will allow AB-InBev to make a significant contribution to a resource-efficient, low-carbon and climateresilient economy.



BEVERAGE is:

Using nitrogen bubbling as an alternative for extensive evaporation, hereby reducing usage of fossil fuels

All functions of boiling performed with BEVERAGE technology, without the heat requirements

Implementing the technology in two pilot breweries, Jupille and Magor with different design of boiling kettles

When two pilot installations are successful, the roll-out to other breweries can be initiated





With this project we contribute to our **2018 environmental goals** and beyond:

Reduce water usage to a leading-edge 3.2 hectolitres per hectolitre of production

Reduce energy usage by at least **10%** per hectolitre of production on top of the level we achieved in 2012

Reduce global greenhouse gas emissions in beverage production by another **10%** per hectolitre of production.

With a successful realization of the pilots, we estimate the following **impacts in the 2 breweries**:

Reduction of water usage with **2%** on top of the level achieved in 2014

Reduction of energy usage with 12%

Reduction of carbon footprint with 8%

While aiming at reaching these environmental goals, the **brand integrity** and high quality standards of our beers needs to be maintained or improved.



IMPLEMENTATION

OF BEVERAGE TECHNOLOGY IN PILOT BREWERY JUPILLE

In the Jupille brewery, the first pilot installation was erected. Below the boiling kettle design can be found. The wort will be taken out from the bottom and passed through the heat exchanger in the external loop. The wort will flow to the deflector, thereby spreading the wort onto the wort surface. The nitrogen will be brought into the external loop of the boiling kettle, and bubbled into the liquid. Therefore the pilot in Jupille is an external energing system

external sparging system.





DEFLECTOR

The boiling kettles in the Jupille brewery were originally not equipped with deflectors. Therefore, in the first phase of the technology implementation, they were installed in two boiling kettles of brewline 3. A picture of the deflector can be found above. The spreading motion of the liquid onto the top wort liquid will be imperative for the breakage of the building-up foam. The nitrogen might form a thick foam layer, which can be addressed accordingly by the spreading motion of the wort.



NITROGEN DOSING LINE

In the second phase of the implementation, an automatic nitrogen dosing line was installed (picture above). The nitrogen coming from nitrogen tanks, is supplied to this dosing line. From here the nitrogen will flow automatically to the sparger/sprayball, installed in the external loop of the boiling kettle. The sparger or sprayball installed in the loop will bubble the nitrogen into the passing-by wort.



IMPLEMENTATION OF BEVERAGE TECHNOLOGY IN PILOT BREWERY MAGOR

In the Magor brewery, the implementation of the BEVERAGE technology is quite different (picture below). Similar to Jupille, however, the wort will be taken out from the bottom and is passed through the heat exchanger in the external loop. The wort will enter the boiling kettle from the bottom and is projected indirectly to the deflector, which will spread the wort on to the top wort liquid. More distinctively, the way of supplying nitrogen in the liquid is different. In contrast to Jupille, the nitrogen will not be brought into the external loop of the boiling kettle. It will be bubbled into the liquid by a ring of sprayballs, installed in the bottom of the tank. Therefore the pilot in Jupille is an **internal sparging system**.





NITROGEN GENERATOR

In the Magor brewery, a nitrogen generator was installed. This generator is able to filter nitrogen out of air, by flowing air through molecular sieves. The filtered and purified nitrogen gas will be transported through the nitrogen dosing line towards the ring of sprayballs in the bottom of the tank. The nitrogen generator in Magor can be seen on the picture above.

RING OF SPRAYBALLS

Above, a picture of the ring of sprayballs in the bottom of the tank is shown. The nitrogen coming from the generator and nitrogen dosing line will be supplied to this ring of sprayballs, installed in the bottom of the boiling kettle. Hereafter, the nitrogen will be bubbled into the liquid throughout the boiling step. This high contact between the nitrogen and liquid allows a high stripping efficiency.

This brochure of the LIFE BEVERAGE project, reflects only the author's view.

The Agency/Commission is not responsible for any use that may be made of the information it contains.

Coordinating beneficiary: Han.Vandenbroucke@AB-InBev.com Website: http://www.ab-inbev.eu/beverage.html LIFE15 COM/BE/000090 - BEVERAGE

