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BRASSERIE LICORNE, French brewery: Saving water and energy through computer-based optimization of the pasteurization process

PROFIL DE L'ENTREPRISE

Name : Brasserie Licorne
Location: Saverne, Alsace (France)
Branch: Agribusiness, Brewing
Foundation: 1845
Employees: 189 (November 2022)
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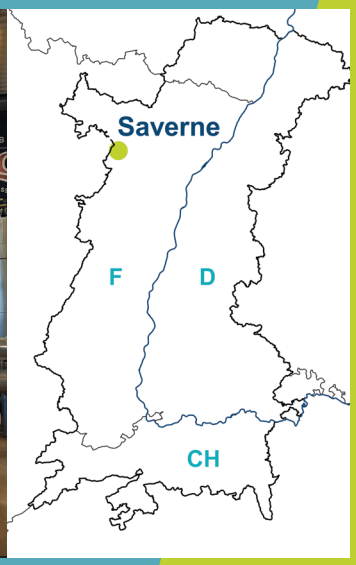

Context and challenges

BRASSERIE LICORNE, formerly Brasserie de Saverne, is a traditional brewery located in Saverne, in Alsace, since 1845. The brewery, named after the symbol of the city of Saverne, produces a wide variety of beers, whether they are lager, red but also amber and black.

As many enterprises in the Upper Rhine region, Brasserie Licorne faces serious challenges due to climate change:

- More frequent and severe droughts in Central Europe —> increasing risk of water scarcity, water use restrictions and poorer water quality
- General warming trend, longer summers —> cooling energy demand is rising

For Brasserie Licorne, these changes are taking place in a specific context characterized by:

- Rising energy costs (long term trend)
- Aging energy infrastructure on the site
- Access to "C2E" subsidies (France-specific subsidies to foster sustainable development)
- No company-owned wells, dependent on city water
- Pressure by French water authorities to save water and monitor water consumption

In 2018, the company decided to implement concrete actions to reduce energy consumption. This turned into a complete CSR (corporate social responsibility) approach, which started integrating a few years later the protection of the water resource.

Goal(s)

Reduction of water consumption as a measure to increase climate change preparedness.

Innovative solution

Optimization of the pasteurizer by implementing a new, sophisticated automaton programme

Why?

Accounting for **20% of the site's total water consumption**, the pasteurizer presents a large potential for saving water.

How does it work?

Pasteurization is a step in the beer manufacturing process, which consists of a **thermal process**, combining temperature and time, in order to **render inactive the potentially pathogenic microorganisms** contained in the product and to increase its use-by date.

Within the pasteurizer, the beer bottles advance **on a conveyor, passing through 10 baths:** we distinguish 3 baths of „entry zone", and 3 baths of „exit zone" (where systems of energy recovery are set up, via transfers between zones); while the 4 other baths, in the center of the process, are the „pasteurization zone". If the beer arrives at a temperature of 10°C and leaves at 25°C, it reaches within the zone of pasteurization by an **average temperature of 60°C,** being able to even reach 63 to 64°C.

In theory, when the system is in equilibrium, the system of water and energy consumption is optimized; however, there are often stops and gaps between the bottles, which **destabilize the system of optimization** of the water and energy consumption.

The solution deployed by Brasserie Licorne consists in **installing a new computer program which regulates the automatism of the pasteurizer.** This new program, essentially based on code and therefore physically intangible, is based on a philosophy of temperature management in order to reach the different stage of pasteurization, and which allows to consume much less water.

Rechercher les icons ? **(use icons from ppt)**

Résults

A significant reduction of water consumption thanks to the pasteurizer optimization: from 3.75L water for 1L beer to 3.5L water for 1L beer.

(the average in the brewing industry being 5L of water for 1L of beer)

Results in numbers:

- Slowing down of the water renewal circle within the pasteurizer from 5m³/h to 1m³/h
- An annual reduction in on-site water consumption of 15%, i.e. 40,000 m³ of water
- An annual reduction in gas consumption on site of 5%, i.e. 2 GW of gas
- An annual reduction of 858 tons of CO_2 emissions, i.e. 220 trips around the world by car
- An 80% saving in chemical products (excluding salt), in terms of weight
- A saving of 200 hours of FTE [Full Time Equivalent], i.e. the time spent by the agents in charge of cleaning the pasteurizers

Investment & subsidies

- The investment costs are lower than that of other solutions considered to reduce water consumption at the pasteurizers, which all involved a change in infrastructure
- Return of invest of one year with the financial support of the Rhine-Meuse Water Agency (40% funding)

Positive side effects

- Reduced need for biocides linked with reduced water consumption and new cleaning method (in situ chlorine generation by salt electrolysis)
- Less wastewater discharge, less costs: as Charles Guyot says, the brewery prefers „not to pollute rather than to buy the right to pollute"
- Increased employee awareness of „water savings which, historically, speak to employees even more than energy savings"
- Development of a true company culture, linked to the reduction of the impacts of the activity on the environment
- A „green" image, but without "green-washing"

Global approach

Several other actions have been carried out since 2020 to reduce the site's water consumption:

- **Optimization of CIP** [Clean-in-Place] via a change in the cleaning method and a reduction in program time
- In the boiler room, **reuse of condensate from steam** (water treatment by osmosis) as make-up water
- **Replacement of water-intensive installations,** such as vacuum pumps with dry vacuum pumps
- On some stations, **use of the glycol water cooling method,** limiting water losses
- On a station with lost steam, **replacement by a hot water loop** (intended, in the long term, to be heated by water recovered via a heat recovery system)
- Reduction of water consumption by **reduction of the gas consumption**, which has been reduced by 30% in a few years

In the long term, Brasserie Licorne aims **to reduce its ratio of approximately 3.4L water for 1L beer currently to 3L water for 1L beer.** Indeed, the **motivation to continue and increase the actions** carried out within the framework of the **CSR approach** is all the stronger:

Charles Guyot considers that *„there is still a lot to do".*

To go further

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