



Project Information Sheet

Innovative combination of water treatment technologies for the reduction of water consumption and waste in the beverage industry (LESS-WATER BEV.TECH.)

Programme area:	CIP-ECO-INNOVATION 2013
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Website:	To be delivered at 6 th month
Benefits (max. 150 characters incl. space):	Reduction in raw water consumption and increase in waste-water recovery. Increase sustainability & competitiveness of the European Beverage Industry.
Keywords:	Water saving Waste-water treatment & recycling Sustainability of Beverage industry
Sector:	Food and Beverage
Type of solution	Process & technology
Duration:	01/10/2014 – 30/09/2017
Budget:	€ 1.801.311,00 (EU contribution: 49,96%)
Contract number:	ECO/13/630314

Summary

The project proposes an integrated set of innovations through the creation of a new water treatment and recovery system able to dramatically reduce the use of primary water in beverage preparation plants, through:

- a new double Reverse Osmosis system able to increase the water treatment efficiency and to reduce both the raw water consumption and the wastewater production;
- a wastewater post-treatment system to recover part of the wastewater produced by the beverage production process and by the Clean-in-Place treatment;
- a feasibility study of an “ad hoc” small biogas power plant, to convert the organic solid waste generated from the wastewater post-treatment system into energy, in order to increase the energy efficiency of the beverage production process.

In the EU, the highest amount of water consumption is from industrial production, and Food & Beverage is a very water intensive industry. The improvements and innovations in such industry, leading to a reduction of the required primary water, could save enormous quantities in the consumption of such a crucial resource, contributing to decrease the environmental impact of beverage production, to significantly decrease the beverage production costs and so to increase the competitiveness of EU Beverage industry.



Expected and/or achieved results

1. Primary water savings (67.000 l/h against 100.000 l/h of the baseline plant, -33%) and wastewater discharge from Reverse Osmosis that passes from 25.000 l/h to 11.000 l/h (-56%).
2. Recovery of about 75% of the total drained water to reuse it in the drink syrup preparation with a total saving of 33.000 l/h or 14.850.000 cbm per year at the end of the project (99.000.000 cbm per year after two further years) in comparison with the baseline plant.
3. Reduction of Greenhouse gas emissions: CO₂ -152.553 tons / year (-27%); Methane -278 tons / year (-32%). Air quality improvements: Particulate matters -478 tons / year (-32%); PM 2.5 -7.376 tons / year (-26%); PM 10 -9.804 tons / year (-26%); Resp. Organics/Inorganics -54.121 DALY / year (-29%). Reduction / substitution of dangerous substances: Irritant / Corrosive, -631 tons / year (-30%); Mutagenic / Carcinogenic -714.000 MBq /year (-26%); Toxic -204.381 kg / year (-32%); Persistent / Bioaccumulative, -12 kg / year (-2%). Waste management: organic solid waste new treatment 37.500 tons / year.
4. The average water treatment plant for a bottling line has an yearly water consumption of about 150 million litres of water, so with an yearly cost of about €318.000 (using average price of water in Europe, which is €/mc 2,12). The new technology will give an economic advantage of about €80.000 every year for the entire economic life of the bottling plant (15 years on average), for a total of about €1.200.000. These are conservative figures. More realistic figures shows a yearly saving of about 125.000 m³, or of about €265.000. These economic result would impact directly the bottom line in the income statement of Carbonated Soft Drinks (CSD) producer: given the actual level of profit obtained on each can sold, the economic impact of saving 25% of water into the industrial process (significantly below the real targets set with the proposed Action), would mean the total profit generated by the total production of about 40 working days of an average bottling line.
5. In the EU is estimated a total of about 5.000 bottling lines, distributed in about 1.500 bottling plants. Given the average consumption of water of about 30.000 l/h, the potential impact of the proposed project, both in terms of water saving and cost reduction, is enormous. A market share of 3% of adoption of the new technology (by Year 5 since the beginning of the proposed project), would mean an estimated reduction in water consumption of more than 205 billion of litres per year, or more than 430 million of Euro in cost saving. Worldwide, is estimated a total of about 75.000 bottling lines, so the total potential impact of the new technology would be even bigger (about 3 trillion of litres saved every year). These data are referred only to the CSD industry: the figures would be at least doubled considering also other beverage industries like Not Carbonated Drinks, RTD Ice Tea, Energy Drinks, Juices, Nectars, etc.

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