

# Innovation and sustainability in the *circular economy*

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**B**y manufacturing machines with an innovative design equipped with IoT technology, SMI provides customers from all over the world with smart solutions, capable of satisfying their needs in terms of production efficiency, operational flexibility, energy saving and ease of use and monitoring of bottling and packaging lines. The latest developments and the considerable and continuous investments in Research & Development have led to the launch of compact, ergonomic, eco-friendly machines, such as the ECOBLOC® ERGON integrated systems for the stretch-blow moulding, filling and capping of rPET containers recently installed at Danone Group's Société des Eaux de Volvic plant. When we talk about purity and quality, it is the accurate work carried out by the bottling company Société des Eaux de Volvic that comes to mind. The whole bottling

process undergoes careful controls to satisfy the high levels of quality required by the French company and its owner Danone, a goal that is achieved by protecting the water source and safeguarding the natural environment all along the distribution chain, till the moment the bottled product is consumed. All of this is taken care of in minute detail, involving partners and suppliers, as with the recent investment for the purchase of a new bottling line, for 8L containers in 100% recycled plastic (rPET), which involved SMI for the supply of an integrated system ECOBLOC® ERGON. The project is the result of a strong synergy between Volvic-Danone and SMI; both companies shared goals and expertise from the design phase to the installation works, with every choice rotating around the necessity to get higher than average bottle performance and quality, safeguarding the final product, eco-friendliness and operational efficiency of the whole production process.

**From the source to the table: the quality is always under control**

Sustainable development, respect for the environment and product quality and purity are the fundamental elements at Société des Eaux de Volvic SA, company, which has been part of the French Danone food and beverage group (water dept.) since 1992. The natural purity and unequalled quality of Volvic water begins by carefully protecting the source and accurately monitoring the natural environment from where this precious liquid flows. The water is conducted through stainless steel pipes from the source to the bottling plant, without any external contact; therefore, from the depth of the volcanic stratum it reaches the protected environment of the inside of a sterile bottle. To protect the liquid from any external contamination, Volvic



bottling plant was designed according to advanced automation and security criteria, fully satisfied by the ECOBLOC® ERGON integrated system supplied by SMI to the French company. The bottle has the fundamental role of maintaining the purity of the spring water and preserving the quality until the product is consumed; for this reason, the bottles blown, filled and capped by the ECOBLOC® ERGON system need to go through a long series of controls within the bottling line and every day undergo accurate tests carried out by Volvic Quality Laboratory.

#### 100% rPET bottles

Volvic natural, mineral water arrives at the consumers' table as pure as when it flows from the source and is not treated in any way that can alter the taste; for this reason the container plays a vital role towards maintaining the purity of the water, from the source to when it is consumed. The most widely used material for bottling water is PET (polyethylene terephthalate), an unbreakable, plastic material that is lightweight and 100% recyclable. Volvic's high regard of environmental issues led the French company to develop modern solutions for the recycling of PET, so that a new bottle can be produced from an old one. Volvic was one of the first companies to use recycled plastic (rPET) to produce containers and caps, slowly increasing the percentage of rPET, until it hit 100% with the new 8 litre bottle. The 8L container with a square base, in the same style as the smaller Volvic bottles, was studied by a designer at Danone to create an extremely practical, home use, container-dispenser. Its shape, part of which is slightly tilted, ensures that the bottle can be easily positioned on a flat surface and, thanks to the special cap which is used as a tap, the supply of the product is convenient and easy. The new design of the maxi container was accurately reproduced by SMI, to create the moulds that are installed on the ECOBLOC® ERGON HC EV integrated system and which allow it to manufacture a harmonious bottle with a clean design, that perfectly mirrors the purity of the water that it contains.

Eco-packaging and eco-formats are concepts that have always been a part of Volvic. Between 2008 and 2012 the French company reduced the quantity of plastics used in its bottles around the world by 6.5% and since 2008 it has reduced the carbon footprint (total emission of greenhouse gases) of the packaging by 40%. Recognisable by the green cap, Volvic 0.5 L and 1.5 L bottles were the first in France to be produced with a type of plastics that is 20% of vegetable origin, favouring the use of renewable materials. Furthermore, as large capacity formats use less plastics, Volvic has always tried to promote them and produce ecological formats, like the 8L bottle, bottled by the ECOBLOC® ERGON HC EV recently supplied by SMI.

#### SMI solutions for Société des Eaux de Volvic SA

To satisfy market request for bottled water, in 100% recycled PET (rPET) containers, the French company invested in the purchase of machinery from the ECOBLOC® ERGON HC EV range, supplied by SMI, the ideal solution to produce, fill and cap square based 8L containers in rPET, with a production capacity of up to 3,200 bottles/hour. The new investment was studied in detail, creating strong teamwork between the experts at Volvic and Danone and the designers at SMI.

The complete production process was designed so that every step of the bottling is kept under constant control; indeed, it is here that the water coming from the deep underground comes into contact with the external environment and is at a greater risk of contamination which would compromise the sensory, chemical, physical and microbiological properties. The Société des Eaux de Volvic SA, also, pays particular attention to everything that concerns sustainable development,



environmental respect, product quality and purity; for this reason the whole bottling, packaging and distribution process was designed around these values and the machine supplied by SMI was integrated with sophisticated inspection systems, which, starting with the preforms, carry out a long series of checks to maintain the quality and purity of the spring water.

#### Main advantages of the integrated system:

- compact, flexible solution for stretch-blowing, filling and capping bottles in PET, with the advantage, in terms of reducing production costs, as the system does not need a rinser, nor conveyors between the blower and the filler or accumulation
- isolating system between the "dry" area of the blower and the "wet" one of the filler, through a jet of high pressured, sterile air in excess of 5Pa, which guarantees a clean, hygienic filling system
- application of various accessories to guarantee that the filling system is extremely clean and easy to sanitise with advanced cleaning systems
- innovative preform suction system, situated on the oven infeed star, to remove any tiny impurities that could be on the inside of the preform itself. The air that is inserted into the suction system is filtered, and it is part of the air recovery system that comes as standard on all the range of SMI stretch-blow moulders.
- machine integrated with sophisticated inspection systems with cameras to guarantee the quality of the bottled water, monitor the production process and avoid particles and/or impurities being deposited on the inside of the unblown preforms
- the preforms are blown with sterile air in a sterile environment; this sterility is maintained for all the process of filling and capping
- precise and fast operation, thanks to the electronic, operation control, to motorised stretch rods and the use of high efficiency valves with flow-meters
- reduced energy consumption: the stretch-blow module is equipped with a double stage air recovery system, which allows the reduction of energy costs tied to the production of high pressure compressed air
- high energy efficiency, thanks to IR lamps fitted onto the preform heating module
- base of the filler area is made in stainless steel 316 and slightly sloped to ensure that any spill liquids go down the drains
- electronic capping unit equipped with cap-orienting system during application, which controls correct



- positioning of caps, and a rejection system for overturned caps
- cap sterilisation through jets of ionised air on the cap channel
  - washable cap accumulation table, in stainless steel, equipped with an optional system to suction the caps to remove any impurities that might have deposited on them while moving along the hopper
  - reduced maintenance and running costs of the machine

**The second life of packaging in a circular economy**

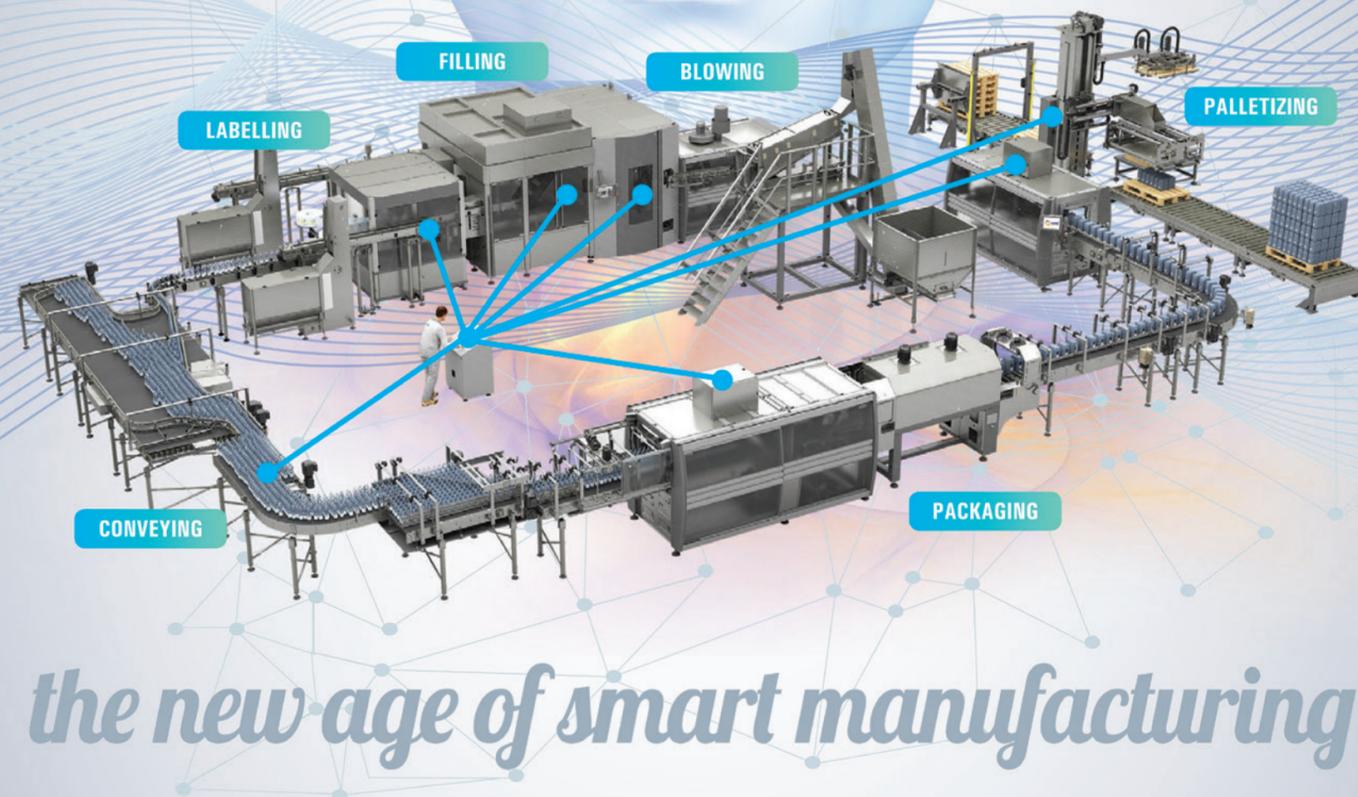
Designed especially to give families the possibility to enjoy the uniquely, precious, Volvic mineral water, in a way that respects the environment, the new 8L eco-bottle was created in 100% recycled plastic (rPET) and is 100% recyclable! It is the first totally recyclable container launched on the market, thanks to the use of caps and labels that are also 100% recycled. For Danone the future of plastic bottles in the beverage industry will move towards rPET and therefore it is betting on this material. In fact, the water division of the French multinational is a great user of plastic bottles for its products under the Evian, Volvic, Badoit and

Salvetat brands, and it is already thinking about bottling them in rPET made from 100% recycled plastics. The bottle created by the ECOBLOC® ERGON HC EV, supplied by SMI, will be the first 100% rPET water container on sale in France, seeing that 8L containers have already captured 10% of brand value sales, and with an important growth of 13,1% in 2018, the success of the new totally, recyclable format is guaranteed. Creating an 8L PET container in 100% rPET is the result of joint work between the specialists at Danone and at SMI. SMI provided the French technicians with one of their own stretch-blowers, so that they could carry out a series of blowing tests while accurately testing the preforms and bottles; these tests allowed them to regulate the "top load" resistance and the material distribution, a step at a time, developing a specially made preform with a specific shape. The biggest challenge, when using recycled preforms, is to guarantee the constant resistance of the bottle when it is being blown, this operation is very difficult with preforms made from recycled material.

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*the new age of smart manufacturing*

SMI is specialized in designing, producing and installing complete lines for food & beverage bottling & packaging.

SMI turn-key systems feature Industry 4.0 and IoT technologies and an output rate up to 36,800 bottles/hour.

THE FACTORY OF THE FUTURE IS ALREADY A REALITY

