



FACT SHEET SIEMENS XCELERATOR IN SPAIN

Ekonoke

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Basic information

- Ekonoke is a start-up company that has set itself the goals of ensuring sustainable cultivation of plants that have a high climate risk and of redefining the food value chains.
- The company combines the latest scientific knowledge in indoor farming with new technologies (internet of things, automation, artificial intelligence, and robotics) to ensure climate-resilient hop cultivation.
- Ekonoke was established in 2018, starting with growing leafy greens. In 2020, the start-up company started indoor hop cultivation.
- Revenue: Ekonoke is still in the process of scaling itself up to an industrial level and – as a result – currently still has very little revenue (2023: €92,000).
- Workforce: The team currently consists of 12 people.
- Ekonoke's shareholders include the four founding partners Inés Sagrario, Ana Saez, Antonio Rojas and Javier Ramiro. In addition, five business angels, two family businesses, and Cosecha de Galicia – which is part of the Hijos de Rivera brewery company (Estrella Galicia). Furthermore, the start-up was supported by friends and family in the starting phase.
- Factories: There is a research center in Madrid and a pilot farm in Chantada, Galicia, Spain.

Technology and customer needs

What are the challenges of growing hops?

- Hops are highly vulnerable to weather fluctuations, drought and high temperatures in the summertime.
- Outdoors, hops only thrive in porous, sandy soils with a pH level of around 6.5 (preferably loess from glacial deposits). Since hops grow quickly and have deep roots, they need plenty of water and a high dosage of potassium, phosphate and nitrogen from around April to September in the northern hemisphere and from October to February in the southern hemisphere. During this time, the hop plant doesn't tolerate any frost and needs at least 15 hours of sunlight. When the rhizomes – underground shoots that grow horizontally – go dormant in the winter, the hop plant needs periods of frost.
- These complex requirements make hop cultivation impossible in most parts of the world. This means that potential regions for growing hops are only found within two narrow bands around the globe at the latitudes between 35 and 55 degrees north and south of the equator.
- For this reason, production is concentrated in just a few countries. The U.S. and Germany account for more than 80 percent of global production. The largest hop growing areas are in the north-west Pacific area of the US with an area of around 24,758 hectares, closely followed by the growing areas in Germany. Hops are grown on an area of over 62,800 hectares worldwide (year 2022, source: Statista).

What makes indoor farming so efficient?

- Indoor farming is the indoor cultivation of crops on several vertically stacked levels.
- Indoor farming enables year-round cultivation that is resistant to climate conditions.
- Tailored, local cultivation ensures high quality with optimized flavors.
- The use of pesticides is not necessary indoors.
- Since indoor farms are not dependent on a specific location, it is possible to achieve higher product quality through proximity to customers.
- Improved sustainability in hop production: 95 percent less water consumption and exclusive use of renewable energy.
- Increased efficiency in hop production: While one harvest per year is possible outside in the fields, up to four harvests per year can be achieved in indoor cultivation.
- Ekonoke has set itself the goal of improving the resilience and profitability of hop production by growing them indoors.
- Modern hop production is all about high quality combined with optimal energy efficiency and improved sustainability. Indoor hop cultivation fulfills this set of requirements through the renunciation of pesticides, proximity to the breweries and independence from climatic conditions.

Siemens technology

- After testing in the laboratory phase, indoor hop cultivation will be industrialized using Siemens technology to replicate the cultivation method for use in other countries.
- After the pilot phase in Alcobendas, Spain, the next step is to take the project to an industrial scale.
- This industrial-scale production will be carried out at the factory in Morás. Another factory in Chantada (Ourense, Spain) with an area of 1,200 square meters serves as a preliminary stage for defining industrial processes.
- This move will be the precursor to the commercial phase of the project, with a larger plant of around 10,000 square meters in Arteixo (Coruña, Spain), near Hijos de Rivera's new brewery. All production at this facility will be exclusively for the brewers of Estrella Galicia.
- Ideally, the indoor farming facility should be located close to the breweries. The aim is for the hops to stop travelling around the world and for the technology and knowledge to do the travelling.
- Once the idea has been successfully tested, Siemens' task will be to digitalize this prototyping technology with the aim of making it fail-safe.
- With its Xcelerator portfolio, Siemens is supporting Ekonoke in setting up industrial manufacturing both in terms of functionality and security. With regard to security, the SCALANCE S industrial security appliances support the defense-in-depth cybersecurity concept. They protect automation networks and connect seamlessly to the security structures of the office and IT worlds. For this concept, S615 LAN routers are used to protect industrial networks and automation systems through firewalls and VPNs by segmenting the network and establishing secure communication channels.

- Once this secure communication has been established, everything will be developed at the engineering level via the Siemens TIA portal – including both the hardware configuration and the programming of the programmable logic controller and the other elements.
- The aim is to industrialize Ekonoke’s production to bring it up to the technological level of brewery customers, such as Anheuser-Busch InBev (AB InBev).
- AB InBev is a Belgian multinational beverage and brewing company. It’s also the largest brewer in the world. The company currently holds a 25 percent share of the global beer market. Its portfolio includes well-known brands such as Beck’s, Spaten, Löwenbräu, Franziskaner Weissbier, Budweiser, Corona and the Belgian Stella Artois.
- In the future, Ekonoke intends to consolidate all the data from its plants in an intelligent management system to make the best decisions about production, profitability and harvest quality.
- The next phase will focus on the projects’ energy efficiency. To achieve this goal, the company is relying on Siemens’ energy management system Simatic Energy Manager PRO. This software supports the user with a comprehensive reporting system for recording and displaying key figures and consumption data as well as with tools for determining key figures for more complex correlations. Ekonoke plans to use the energy management system to reduce its energy consumption by more than 20 percent in the future.

Indoor farming is the indoor cultivation of crops on several vertically stacked levels.

Picture Credit: Ekonoke



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