

Advancing Circular Economy in Silica Production

ZARAGOZA, 19 MARCH 2021 — At one of Europe's largest silica producers, Industrias Químicas del Ebro (IQE), the ZERO BRINE project has demonstrated circular economy through the recovery of resources from industrial waste brine.

The production of silica is highly water-intensive, resulting in brine discharge containing a high concentration of sodium sulphate. Through pre-treatment of the effluent and the application of [two membrane processes](#) – pressure-driven filtration with regenerated membranes and electro dialysis with bipolar membranes (EDBP) – ZERO BRINE is recovering valuable resources and supporting resource efficiency.



ZERO BRINE Pilot at IQE. Photo: ZERO BRINE

Filtration with [regenerated membranes](#) provides pure water that can be reused in the on-site production of silica, reducing the water abstracted, as well as a high concentrated brine from which sodium sulphate can be recovered through crystallisation technologies. The recovery of sodium sulphate allows for additional valorisation in the powdered detergent or glass industry.

EDBP provides water recovery for on-site reuse and two reagents, sodium hydroxide and sulphuric acid, that can also be internally valorised in the production process.

ZERO BRINE – Industrial Wastewater – Resource Recovery – Circular Economy



The ZERO BRINE project (www.zerobrine.eu) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730390.

Full integration of the ZERO BRINE technologies at IQE would reduce water consumption by more than 1 million m³ annually, while the elimination of brine disposal through its conversion to water and salt would see a 60% reduction of sodium sulphate discharged into the Ebro River, providing environmental benefits.

The feasibility of waste heat was also researched at IQE, finding that a reduction of [72% on energy consumption could be achieved](#) with a payback period of 5 years.

For more information, watch IQE's presentation video of the [ZERO BRINE pilot in Spain](#) and see our [media kits](#).

ZERO BRINE is facilitating the implementation of the [EU Circular Economy package](#) and the [Sustainable Process Industry through Resource and Energy Efficiency \(SPIRE\) Roadmap](#) in various process industries by developing the necessary concepts, technological solutions and business models to redesign the value and supply chains of minerals and water while dealing with present organic compounds in a way that allows their subsequent recovery for a new generation of innovative, resource-efficient European business in various process industries.

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