



ZERO BRINE

A circular economy approach

Industrial waste water - Resources recovery – Waste reduction

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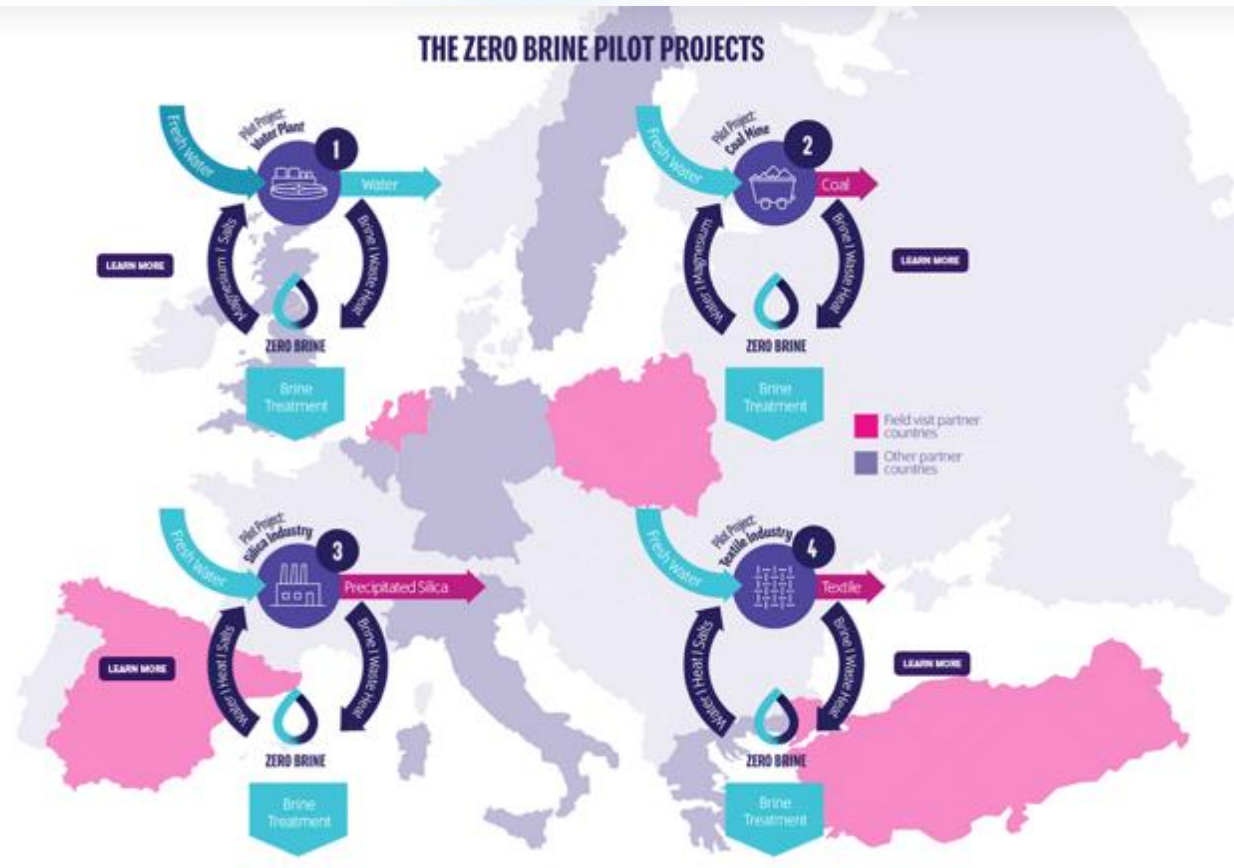


The ZERO BRINE project (www.zerobrine.eu) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730390.



4 industrial sectors

From SPIRE Roadmap to Processes4Planet





1. Demin water plant EVIDES in NL

Resources recovered:

94.7% Calcium recovery ($\text{Ca}(\text{OH})_2$) for external valorisation (>95.6% purity)

87.8% Magnesium recovery ($\text{Mg}(\text{OH})_2$) for external valorisation (>88.9% purity)

93% Sulphate recovery (Na_2SO_4) for external valorisation (unwashed: 94.6% purity)



Industrial Wastewater ◆ Resource Recovery ◆ Circular Economy



2. Coal mine Bolesław Śmiały in Poland

Emissions: 32.5% CO₂ reduction;

Energy: 33% reduction;

Resources recovery:

90.6% water recovery (demi water)

92.8% salt recovery (99% purity)

94.9% magnesium hydroxide recovery for external valorisation (97% purity)

0.84 kg/m³ gypsum for external valorisation





3. Silica mine IQE in Spain

Emissions:

100% reduction of brine discharged to the environment;

60% reduction of sodium sulphate (Na_2SO_4) releases into the Ebro River;

6000 tons/year CO_2 reduction;

Recovered resources:

90% recovery of sodium sulphate (Na_2SO_4) for valorisation (>99% purity);

Sodium hydroxide (NaOH) (94% purity) and sulphuric acid (H_2SO_4) (72% purity).





4. Textile Industry at Zorlu in Turkey

Emissions:

90-95% reduction of brine discharged to the environment;

150-200 tons/year CO₂ reduction;

Resources recovery:

70-80% water recovery from brine treatment system for onsite use;

600-700 tons salt/year for onsite dyeing of textiles.





Knowledge development&sharing

BRINE Excellence Centres:

The Netherlands, Spain, Italy, Greece and Poland

RCE Simulation software package

- Effectivity of technologies
- Energy
- Cost



On-line Brine Platform

Matchmaking between brine suppliers and salt users

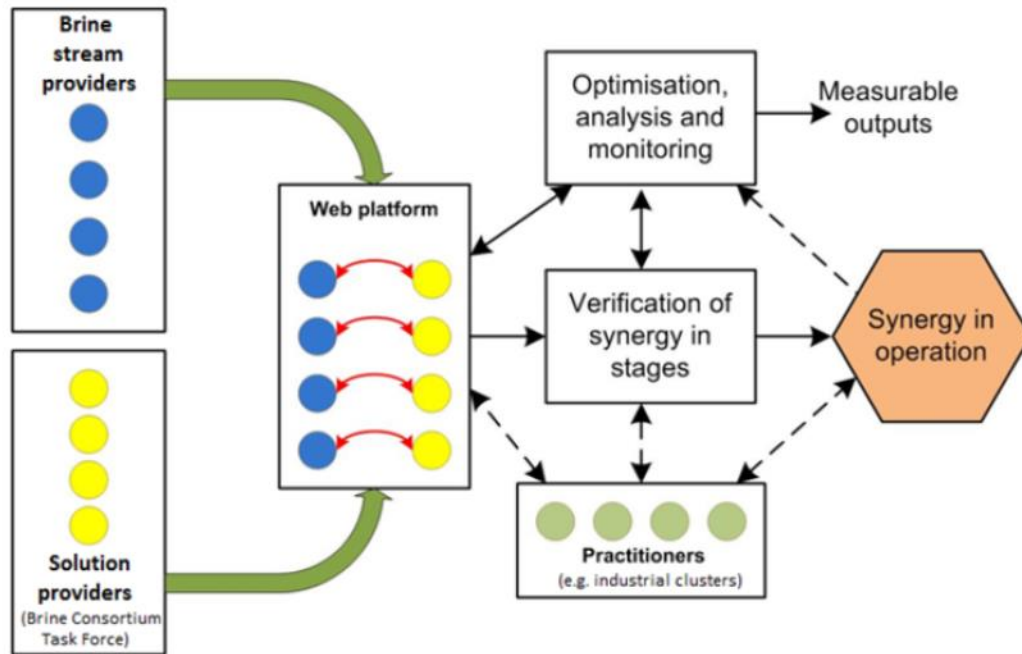
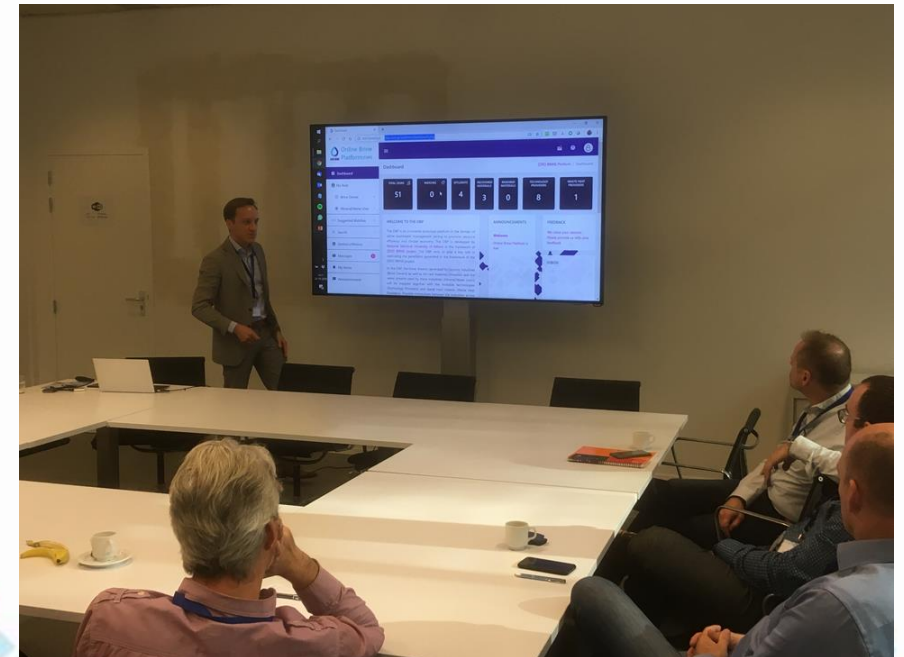


Figure 4: Application of the Online Brine Platform, correlation between brine stream providers, solution providers and practitioners





EU Policy development

EU Policies: Industrial Emissions Directive and the Zero Pollution Strategy

- Requirement for EU Directive to strengthen circularity in production!
- ZERO BRINE Technologies, Best Available Techniques (BATs), to be promoted;
- Investments in circular innovations like the zero brine production chain to be developed and stimulated by a mix of taxes and subsidies;
- One of the points to address is the CO₂ emission, for which emission rights need suddenly be paid once a waste stream turns into a product.



Looking forward

Challenges to move forward, from waste to product:

- Technology development and sharing
- Matchmaking
- Policy development
- Sectoral development through inspiring business cases



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Industrial Wastewater ◆ Resource Recovery ◆ Circular Economy



Thank you for your attention!



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