ZERO BRINE

D10.3 Policy Brief and Reports – Advancing the ZERO BRINE process and demo projects

May 2019

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1. Introduction

Policy briefs and factsheets are seen as one of the most effective ways to reach policy and decision-makers. For this reason, ZERO BRINE will develop a series of policy briefs for effectively communicating and disseminating ZERO BRINE results and recommendations to ZERO stakeholder groups, specifically to policy makers on European and local level (countries of the demo projects), European institutions, environmental agencies, authorities, SPIRE network and media.

These policy briefs will highlight and outline the learnings and recommendations of the project. They will be designed in a P4P (Project for Policy) approach that uses R&I project results to shape policy, ensuring that the ZERO BRINE technology has the best conditions to be implemented in the market.

This way, project results can become an excellent tool for policy makers to:

- provide evidence for policy development and design
- highlight gaps or barriers in current policy frameworks or approaches
- help develop new opportunities and innovative activities for any area of policy-making across Europe and the world.

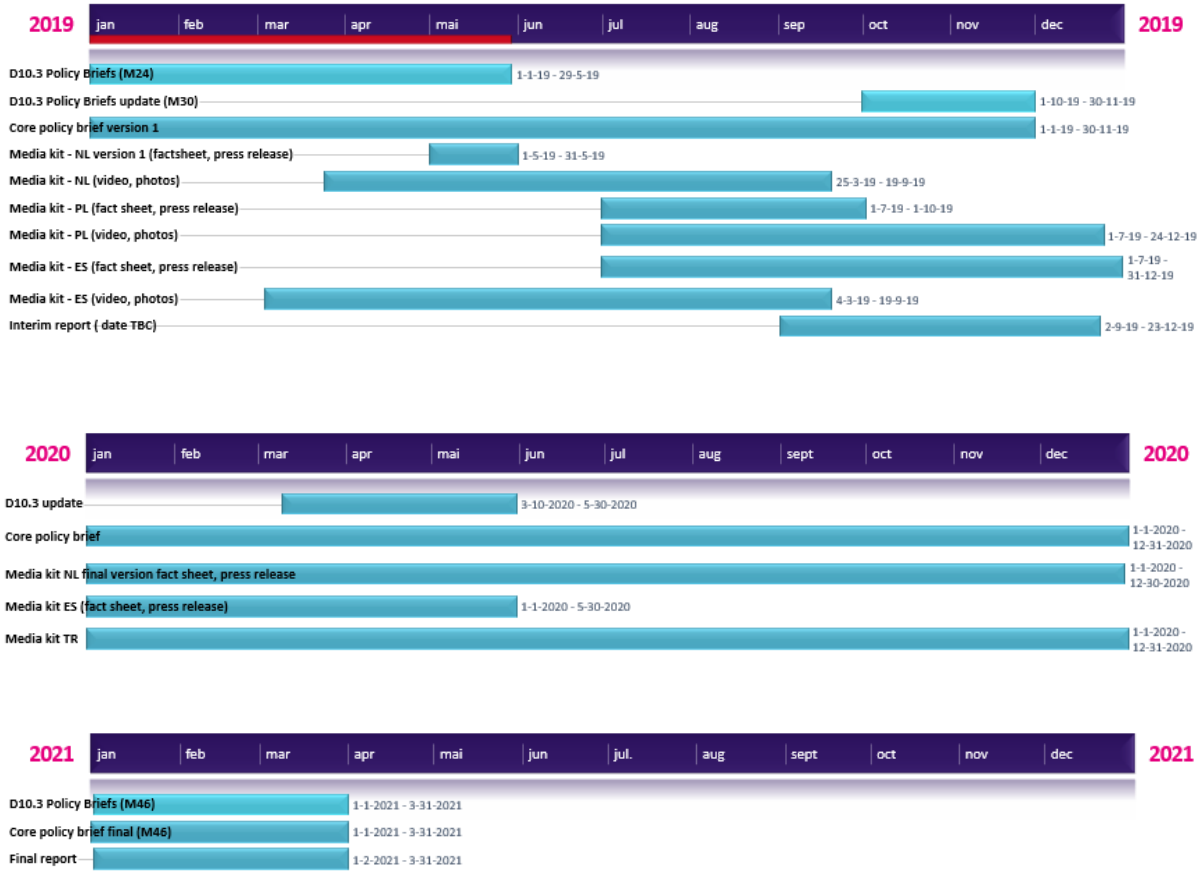
2. Overview

The series of policy briefs consists of a core policy brief and 4 media kits. The core policy brief highlights the project results and recommendations linked to the European and regional policy context with regards to industry (focusing on the industry of ZERO BRINE's pilot plants), circular economy, energy and climate action. For a comprehensible illustration of ZERO BRINE technology, results and business opportunities, 4 media kits, one media kit including factsheets/infographics/interviews and photos for each demonstration site, will be developed once the results are available. Furthermore, the policy briefs will be supported by more detailed annual interim reports (M31) and a final project report (M46) developed by project partners, which will be edited, formatted and designed by REVOLVE.

The policy briefs and reports will be disseminated to EU institutions to targeted departments such as energy, climate action, environment, economy, regional affairs, local government, environmental agencies, SPIRE network and media with full tracking and outreach reporting of the ZERO BRINE project. The core policy brief will be distributed both in print (5,000 copies) and digitally via website, news alerts and social media. Furthermore, they will be distributed at key EU and international policy events such as: the EU Green Week, the Water Innovation Forum, the International Water Summit, the World Water Week, Global Water Summit, European Sustainable Energy Week as well as the yearly Water Innovation Europe events organized by WssTP in Brussels.

The policy briefs are developed within 35 months between M12 and M46 in line with the availability of the results of the pilot plants (WP2, WP3, WP4) and policy review (WP9) (see Figure 1). D10.3 will be updated every six months in M30, M36, M43.

Figure 1 Process Plan Policy Briefs



Task 10.3 is led by REVOLVE, with co-lead WssTP, in cooperation with all partners. Especially inputs and close collaboration with the following ZERO BRINE tasks and partners is essential to communicate and disseminate ZERO BRINE results effectively via policy briefs:

- WP9: D9.2 Report on policy review and assessment / suggestions for BREF update: NTUA
- WP2 (Re-designing the supply chain of water and minerals in the Botlek area): TU Delft, Evides
- WP3 (Minimizing energy consumption and increase resource recovery yields through advanced treatment methods in the coal mine and textile industries): SUT, TUBITAK
- WP4 (Promoting circular economy in the chemical sector): CTM
- WP8 Business plan/market exploitation and replication / IP: SEALEAU, TU DELFT, CTM

3. Outline of ZERO BRINE core policy brief

The ZERO BRINE core policy brief will present the ZERO BRINE results and recommendations linked to the current policy context on European and local level with a focus on climate action, circular economy, energy, industry, economy and environment. It is developed between M12 and M46 in line with the availability of the results of ZERO BRINE pilot plants (WP2, WP3, WP4) and results of the policy review (WP9) and analysis of business plan and market exploitation (WP8) and first core policy brief to be issued in M30.

Draft structure of the core policy brief*:

- Executive Summary
- Overview of Policy recommendations
- Introduction to ZERO BRINE: Developing the circular economy approach for industrial wastewater
- EU Circular Economy package - Europe as the world leader of the circular economy
- EU Clean Energy package for all Europeans
- Circular economy Business opportunities
- Creating climate-neutral industry
    - Case study I: Demineralized Water plant in the Netherlands
    - Case study II: Coal mine in Poland
    - Case study III: Textile factory in Turkey
    - Case study IV: Silica factory in Spain
- Policy recommendations
- Critical views

*The policy brief content structure will be updated along with the development of the core policy brief.

4. Outline of ZERO BRINE media kits

ZERO BRINE is developing 4 media kits including factsheets, infographics, interviews, photos and videos for each demonstration site.

All videos of ZERO BRINE demonstration sites follow the below content structure:

- Challenge: The current situation/problem/barriers
- Need: Why is recovering resources in the respective industry important? > circular economy solution needed
- Technology: Showing the technology, importance and facts about the technology
- Main results created or expected
- Future outlook: usage of technology, benefits, threats, opportunities >> where and what sectors can it be replicated or scaled

a. Case study I: Demineralized Water plant in the Netherlands

The factsheet for the Demineralized Water Plant (DWP) in the Netherlands, version 1 (see Annex) was developed in M24 and distributed during the field visit to salt and industry experts as well as international and local media outlets specialised in water. The fact sheet will be updated once the results of the pilot plant are available (expected in M43).

Infographics that illustrate the results in a comprehensible way will be developed for the factsheets once the results are available M25-M43). Furthermore, they will be extracted and used for social media online shareables to target policy makers, European institutions, environmental agencies and media.

The interview with an expert of this pilot plant will be published once the results are available (M25-M43).

Photos of the demonstration site are available on the project website (see here).

The video will be developed between M24 and M28.

b. Case study II: Coal mine in Poland

The factsheet and infographics for the demonstration site in Poland will be developed between M26 and M31 based on the results of the demonstration.

The interview with an expert by SUT will be conducted M29-M31.

The photos of the demonstration site will be taken in M29 during the field visit and available on the project website. The video will be produced during the field visit and available by M31.

c. Case study III: Textile factory in Turkey

The factsheet and infographics for the demonstration site of the textile factory in Turkey will be developed between M33 and M43 based on the results of the demonstration.

The interview with an expert by TUBITAK will be conducted M33-M43.

First photos are available on the project website (see here). More photos of the demonstration site as well as the video will be produced during the field visit M33-M43.

d. Case study IV: Silica factory in Spain

The factsheet, infographics and interview with an expert by CTM about the demonstration site of the silica factory in Spain will be developed between M25 and M36 based on the results of the demonstration.

First photos are available on the project website (see here). More photos of the demonstration site as well as the video will be produced throughout M24 and M28.

ANNEX

a. Factsheet Netherlands

ZERO BRINE

ZERO BRINE PILOT DEMONSTRATION

DEMINERALIZED WATER PLANT (DWP) OF EVIDES IN BOTLEK, ROTTERDAM, THE NETHERLANDS

Context

ZERO BRINE advances circular economy business model solutions to reduce industrial saline wastewater streams by recovering and reusing the minerals and water from the brine. Demineralized water is an essential commodity in the Botlek area, the industrial district of the port of Rotterdam, because it is required for many production processes. Reverse osmosis (RO) has become one of the main processes for producing demineralized water, but reverse osmosis alone is not enough to produce water of the required purity from the available water (fresh surface water), and several pre- and post-treatment processes are used. At the Evides DWP, one of the largest demineralized water production facilities in Europe, wastewater is treated by reverse osmosis combined with ion-exchange softening, among other technologies (see Graph 1).

Objective

At the Demi Water Plant (DWP) of Evides in the Botlek industrial area, ZERO BRINE demonstrates the circular economy approach to treat industrial wastewater through redesigning the current brine treatment process from linear to a circular model recovering all the resources (see graph 1). A large-scale demonstration plant is tested at PlantOne, a test facility focused on sustainable technology and innovation in the Energy Port and Petrochemical cluster of Rotterdam Port, by using the waste heat from one of the factories in the port. The objective is to recover Ca- and Mg-salts as well as demineralized water from the discharges of the water-softening unit. The quality of the recovered products will be aimed to meet local market specifications.

Technology

The demonstration plant comprises two sites combining residual heat and wastewater streams with the aim to eliminate brine effluent (zero brine discharge). At Evides (Site 1) the aim is to treat the regeneration solution of the ion exchange (IEX) unit (spent regenerant) and to recover valuable minerals and salts as well as water from this flow. This is done by nanofiltration, crystallization and evaporation of IEX (see Graph 2). Site 2 is an innovative design that aims to treat the reverse osmosis concentrate of DWP. Additionally, nyex is used to remove the anions and charged organic matter (see Graph 3).

Business opportunities

Industrial saline impaired effluents (brines) are an environmental challenge and an economic opportunity. The following materials with potential commercial value are recovered on the two sites that will be used in the same factory by Evides or in the industrial area Botlek.

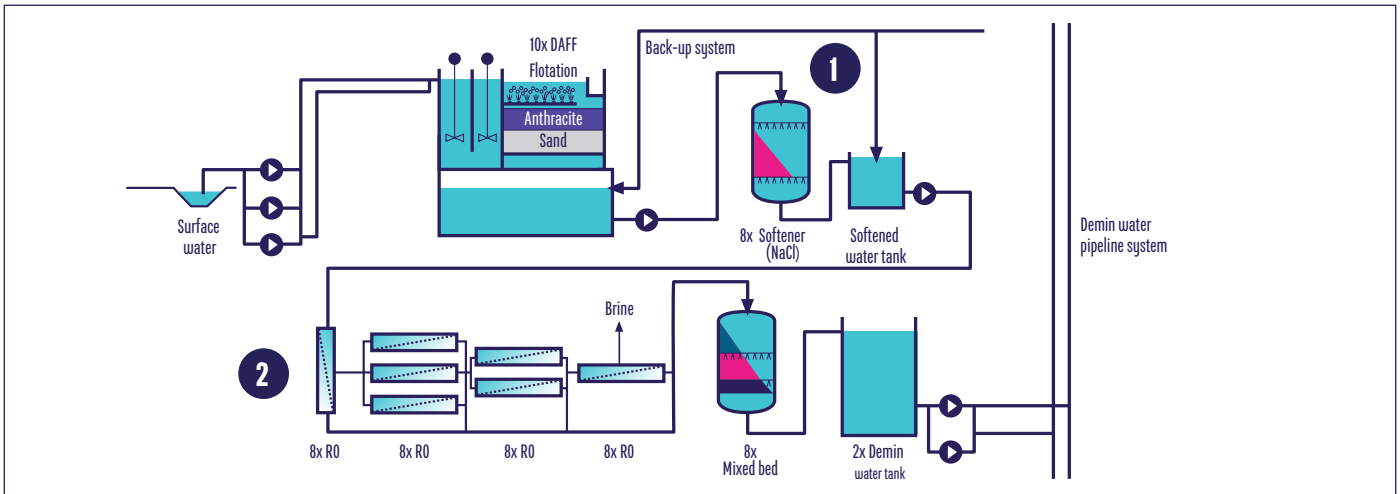
Site 1

- High purity magnesium & calcium
- Clean Water
- NaCl regeneration solution

Site 2

- Sulphate salts
- NaHC03
- Clean Water
- NaCl regeneration solution

Graph 1: Schematic view of the current processes at the DWP plant at Botlek



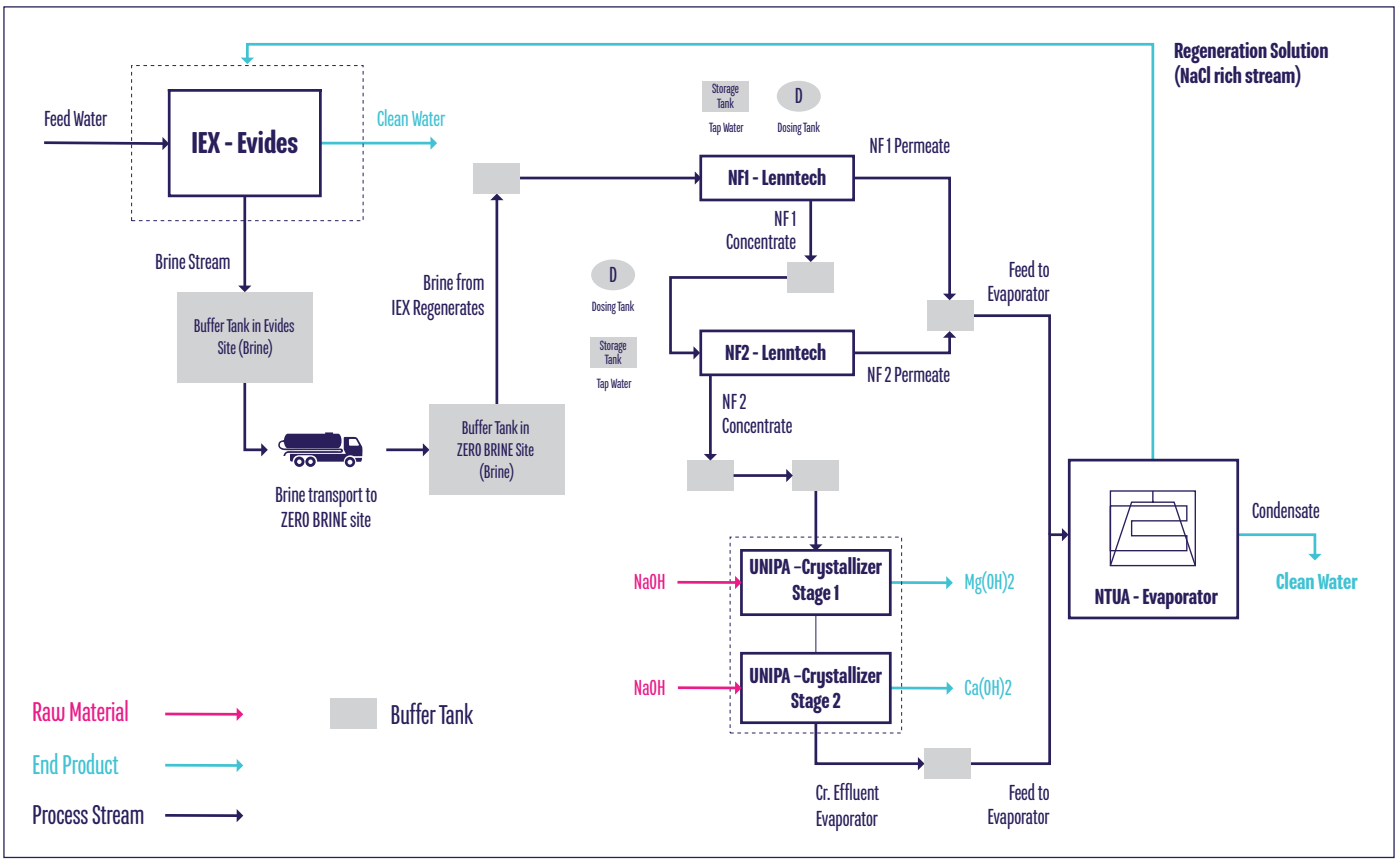
1 Site 1: Technologies

Demonstration of Nanofiltration (NF) – Crystallizer (MF-PFR) Evaporation for treatment of Ion Exchange (IEX) Regenerates

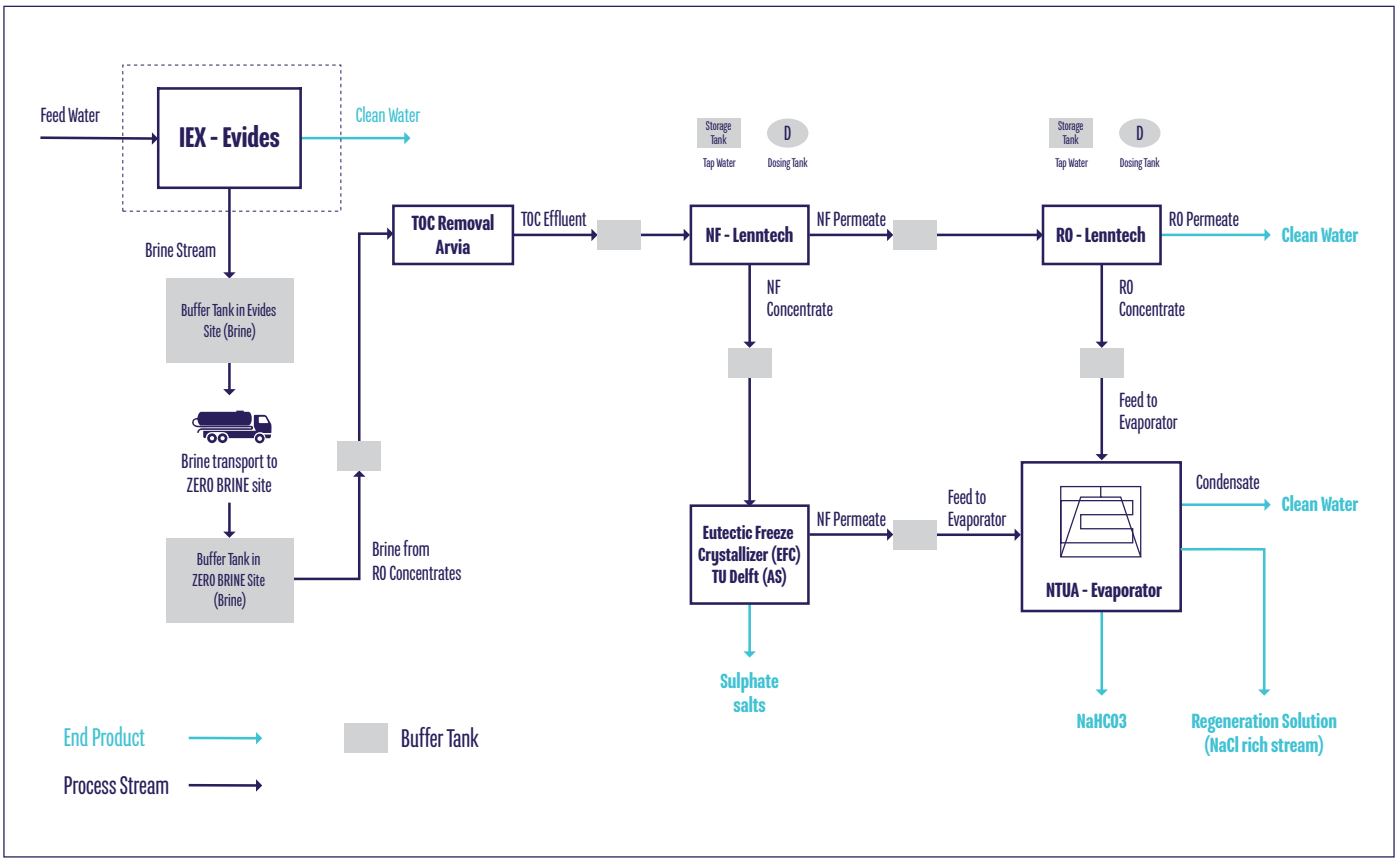
2 Site 2: Technologies

Nyex (TOC Removel) – Nanofiltration – Reverse Osmosis (RO) – Evaporation Eutectic Freeze Crystallization (EFC) for treatment of RO Concentrates

Graph 2: Site 1



Graph 3: Site 2



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