

## CHALLENGES

- ▶ Industrial water reuse results in residual streams which constitute up to 40% of highly concentrated brines (concentrates)
- ▶ These concentrates contain salts, non-biodegradable organic compounds and heavy metals
- ▶ Processing of concentrates for the recovery of valuable substances such as salts, metals, etc.
- ▶ The importance of concentrate treatment for water protection, reuse and cost reduction
- ▶ The challenge for the new technologies is to selectively produce recycled valuable materials of high quality
- ▶ Developed technologies should be applicable to various types of wastewater

## CONSORTIUM / CONTACT

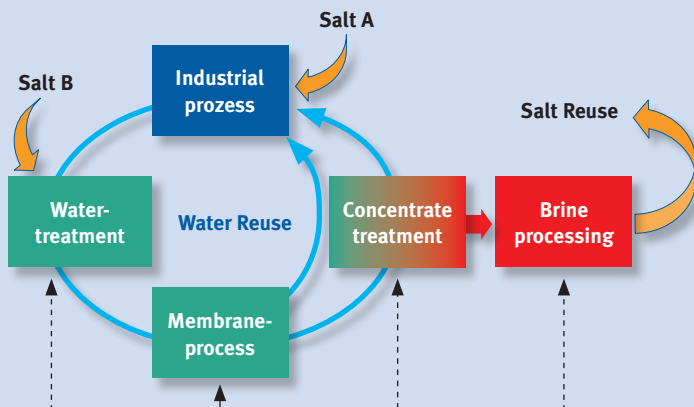
### CONSORTIUM



# HighCon



## Resource recovery from concentrates arising from industrial water reuse



HighCon Concept

### CONTACT

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[www.highcon.de](http://www.highcon.de)

The aim of the HighCon project is the further development, optimisation and combination of specific processes for the reuse of industrial wastewater with the goal of complete closed loop circulation as well as the treatment and utilisation of the concentrate contents.

This goal is to be achieved by developing processes and treatment steps for industrial applications, adapted to wastewaters from selected demonstration sites.

Objectives:

- ▶ Development of selective processes for water reuse and utilisation of the compounds within the concentrate
- ▶ Reduction of energy demand, e.g. through further development and optimisation of evaporation processes
- ▶ Holistic optimisation of processes for water reuse by simulation



Multi Effect Humidification (© TerraWater)

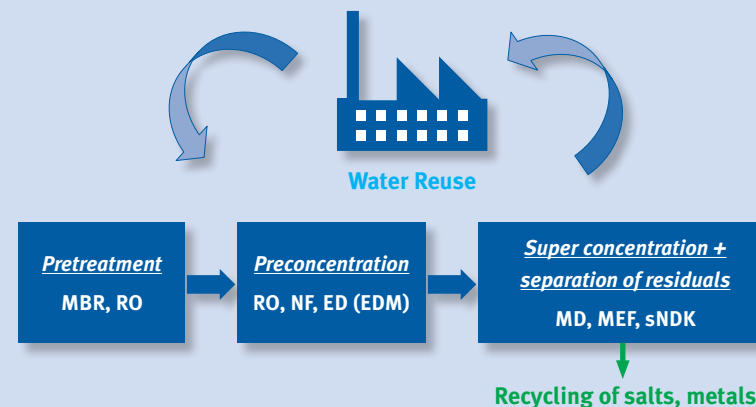
Within HighCon, innovative technologies are further developed by using basic research, and application-oriented investigation, which leads to the adaption to new treatment processes:

- ▶ Membrane Distillation (MD)
- ▶ selective Low Temperature Distillation Crystallisation (sLTDC)
- ▶ Electro Dialysis (ED), Electro Dialysis Metathesis (EDM)

Established technologies are integrated into the process, the focus of the investigation being on the consideration of the interaction of the components within the overall system:

- ▶ Nanofiltration (NF)
- ▶ Reverse Osmosis (RO)
- ▶ Evaporation, Humidification, Crystallisation, Multi Effect Humidification (MEH)

The main focus lies on the development of innovative process combinations for various separation processes.



The technologies and their combinations will be tested under real conditions with different industrial wastewaters.

This is intended as a basis for the later transferability to other industrial wastewater applications.

### DEMONSTRATION SITES

#### 1. CHEMICAL INDUSTRY

**CLARIANT**

#### 2. FOOD INDUSTRY



#### 3. COSMETICS INDUSTRY

**L'ORÉAL**

#### 4. INDUSTRIAL LAUNDRIES

