

Sustainable Soda Ash Production with RecovOAR™ Solution for High-Recovery Brine Concentration

Background

Soda ash (sodium carbonate) is a critical raw material used in the production of glass, detergents, chemicals, lithium compounds, and a wide range of industrial products. As demand for soda ash continues to increase, producers are challenged to maintain efficient operations while managing freshwater consumption, wastewater generation, and rising environmental compliance requirements. Many facilities operate in regions where water resources are limited, making sustainable water management an increasingly important factor in long-term operational success.

The production of soda ash often generates saline and mineral-rich wastewater streams that can be difficult and costly to treat using conventional technologies. At the same time, growing pressure to reduce freshwater withdrawals, minimize liquid discharge, and recover valuable resources is driving the adoption of advanced wastewater treatment and brine concentration solutions. By increasing water recovery, reducing wastewater volumes, and enabling the capture of reusable salts and minerals, modern membrane-based technologies can enable soda ash producers to improve resource efficiency, lower operating costs, and support sustainability objectives.

The RecovOAR™ Solution

RecovOAR™ is an integrated, membrane-based solution designed to recover valuable freshwater and salts using Osmotically Assisted Reverse Osmosis (OARO). By concentrating brine to levels beyond conventional technologies while operating at standard pressures, RecovOAR™ maximizes freshwater recovery, reduces downstream evaporation requirements, and lowers overall treatment costs. For soda ash producers, the solution helps minimize wastewater volumes, recover water for beneficial reuse, and maximize the value of salt- and mineral-rich streams. By transforming complex waste brines into recoverable resources, RecovOAR™ supports sustainable soda ash production.

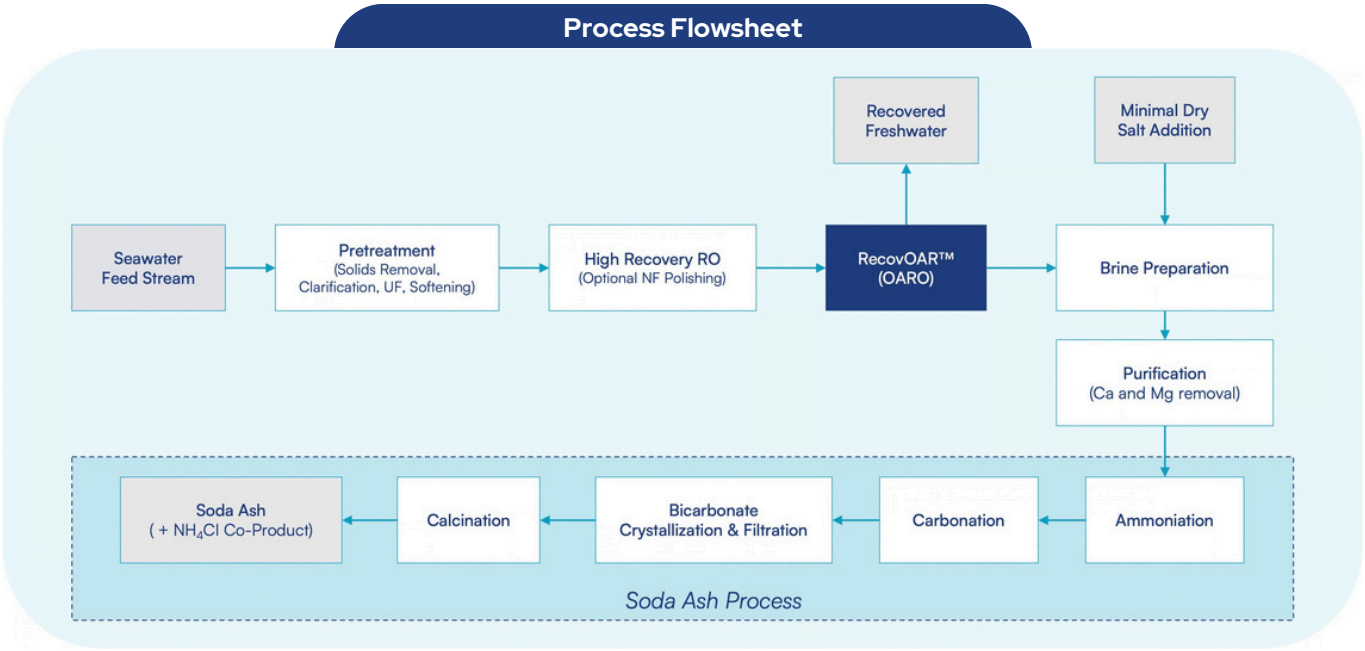
Core Performance Benefits

- Brine concentration to > 250 g/L TDS
- Reduced addition of dry salt
- Handles monovalent, divalent & mixed salts
- Operates at standard SWRO range
- Up to 100% increase in freshwater recovery

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Brine Valorization for Soda Ash Applications



RecovOAR™ (OARO) maximizes freshwater recovery while concentrating high-saline wastewater beyond the limits of conventional reverse osmosis (RO). By selectively separating valuable salts and minerals into distinct product streams, the process reduces wastewater volumes, lowers downstream treatment requirements, and enables the recovery of valuable resources to support a more sustainable and cost-effective soda ash production cycle.

Proof at Scale

System Deployment:

Validating Salt Recovery at World-Leading Desalination Hub

In 2021, FTS H2O validated a RecovOAR™ system at Saudi Arabia's Jubail seawater desalination hub, one of the largest desalination facilities globally. The facility produces over 1.4 million m^3/day of potable water, along with a massive volume of high-salinity brine, representing an opportunity for resource recovery. Over three years of continuous operation, the system enabled the production of sodium chloride from concentrated seawater through the use of Osmotically Assisted Reverse Osmosis (OARO). With RecovOAR™, the plant delivered a recovery rate of 75-78%, producing 0.5 m^3/h of high-purity brine and achieving a 5.7-fold reduction in volume, with an energy consumption of <10 kWh/m^3 of permeate produced.



The soda ash industry has outgrown conventional solutions.

Talk to our team about feed characterization and conceptual flowsheet development for your soda ash project.

Explore our approach to resource recovery:

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