

CAPZ Technology

Seawater-to-Battery Sodium Platform

Clean Energy and Water Technologies (CEWT)

Seawater to Prussian Blue Sodium-Ion Battery

Using CAPZ Process

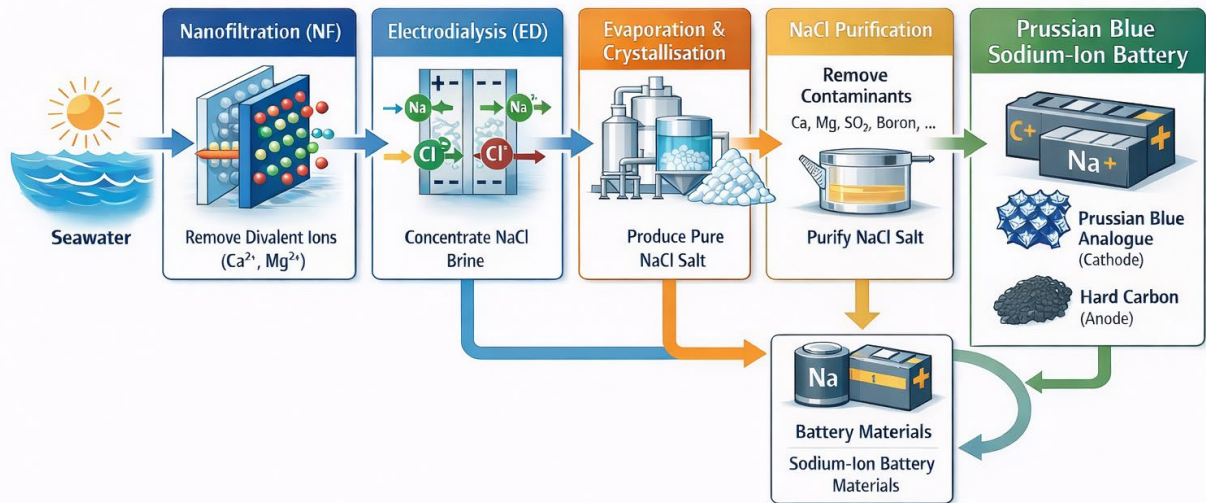


Figure: CAPZ Process – Seawater to Prussian Blue Sodium-Ion Battery

Technical Overview

CAPZ (Controlled Advanced Purification Zone) is a proprietary process that converts seawater into battery-grade sodium feedstock. The process integrates membrane separation, electrochemical concentration, ion exchange purification, and thermal crystallisation.

Process Steps

1. Nanofiltration (NF): Removes divalent ions (Ca^{2+} , Mg^{2+})
2. Electrodialysis (ED): Concentrates NaCl brine (~26 wt%)
3. Ion Exchange: Removes trace contaminants (Ca, Mg, Sr, boron, heavy metals)
4. Evaporation & Crystallisation (HPD): Produces high-purity NaCl crystals
5. Battery Integration: Sodium used in sodium-ion battery materials (Prussian Blue system)

Key Advantages

- Non-mining pathway for battery materials
- Utilises abundant seawater resource
- Converts desalination brine into value
- Enables scalable sodium-ion battery supply chain
- Compatible with grid-scale energy storage systems

Applications

- Sodium-ion batteries (Prussian Blue cathode systems)
- Grid-scale energy storage
- Renewable energy integration
- Industrial decarbonisation

Signature Statement

CAPZ transforms seawater into battery-grade sodium, enabling a scalable, non-mining pathway for energy storage materials and supporting a circular energy system.