jedro LITHIUM

CLOSING THE RECYCLING LOOP

Developing a lithium hydroxide monohydrate production plant in Gospić, Croatia. Our goal is to increase the use of recycled lithium carbonate in the production chain and helping European manufacturers meet the requirements of the EU Regulation Acts.

Hungarian Battery Days

About Jedro Lithium

Project Overview

Since 2022 we are developing a cutting-edge battery grade lithium hydroxide monohydrate plant in Gospić, Croatia.

Planned capacity of two production lines is **25 000** tpa of lithium hydroxide monohydrate.

Commissioning of 1st production line with capacity 12 500 tpa of lithium hydroxide monohydrate will be started at the end of 2025.

Key Objectives

1. To help European battery manufacturers comply with the **European Battery Regulation** regarding the required content of recycled lithium in their products
2. To reduce the European dependence on foreign raw material sources by converting recycled or any technical / industrial grade lithium carbonate to lithium hydroxide monohydrate supporting requirement of **Critical Raw Material Act**

Location Advantages

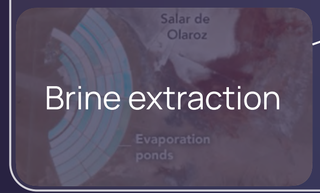
The plant is located in the Smiljansko Polje industrial zone in Gospić, Croatia, providing direct access to utilities and infrastructure, including gas, electricity, and water systems.

Strategically positioned near the A1 federal highway, the plant also offers efficient access to the seaports of Rijeka and Zadar, enabling seamless transportation of raw materials and finished products across the EU.

In close proximity to the plant lies one of the purest deposits of lime in Europe — which directly contributes to the exceptional quality of the final product.

Jedro Lithium in the supply chain

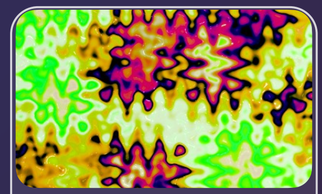
Ore mining



Brine extraction

Technical grade source processing

Refining battery-grade lithium hydroxide (LHM) from technical grade source



Production of Cathode Active Material (CAM)

Production of batteries / Manufacturing scrap

Mechanical shredding

Hydrometallurgy

Technical grade recycled lithium carbonate

Refining battery-grade lithium hydroxide (LHM) from recycled lithium carbonate

We produce lithium hydroxide monohydrate (LHM) from recycled lithium carbonate or any technical-grade source

Project timeline: how it started

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December 2023

Chose the land plot (20 150 m^2) in the industrial zone Smiljansko Polje at the city of Gospić

Main technological equipment is ordered

January 2024

Signed a contract. Started the design for the construction of the first phase

March 2024

Environment protection study for the permitting purpose is completed

The agreement for buying the land plot on a tender base is signed with a city of Gospić administration

May 2024

Received a permission of Ministry of Economy and Sustainable Development after reviewing the Environment protection study

June 2024

An architectural and engineering part of the project is finished.

Signed a contract with the general contractor for the plant's construction — company Međimurje PMP

Project timeline: current status

November 2024

Received an **environmental permit** from the Administrative Department for Spatial Planning, Construction, and Environmental Protection of Lika-Senj County

December 2024

Construction permit received from City of Gospić Administrative Department for Physical Planning and Construction. The land prepared for a construction

March 2025

Concrete construction is finished

September 2025

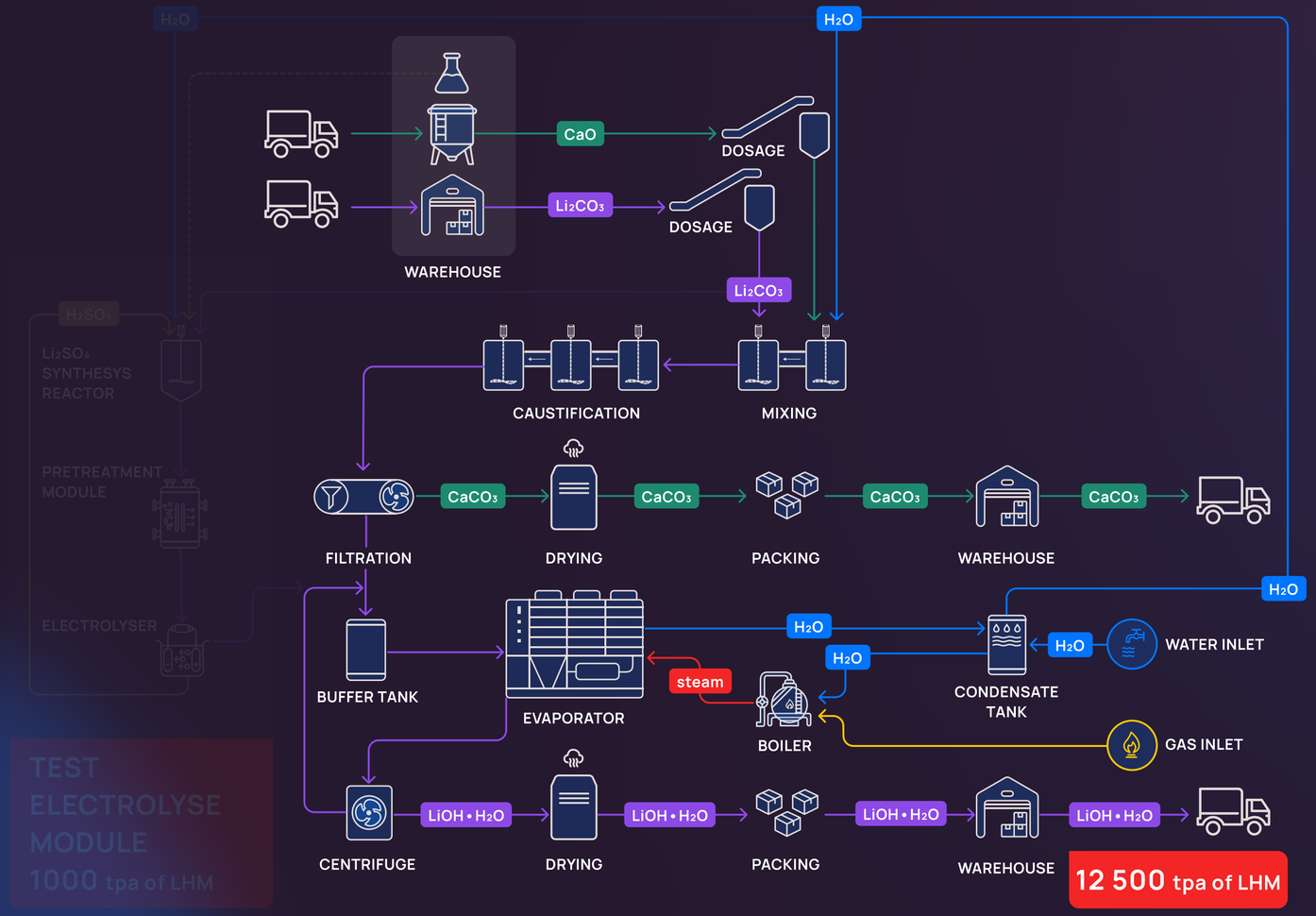
Main evaporation equipment installed. Utilities connection completed (water, electricity, gas), rainwater collection and treatment system are finished

October 2025

Site works have been completed (asphalt paving, building painting). Equipment installation is currently underway. Environment protection study the test electrolyses module is completed

Jedro Lithium production facility – October 2025

Process design



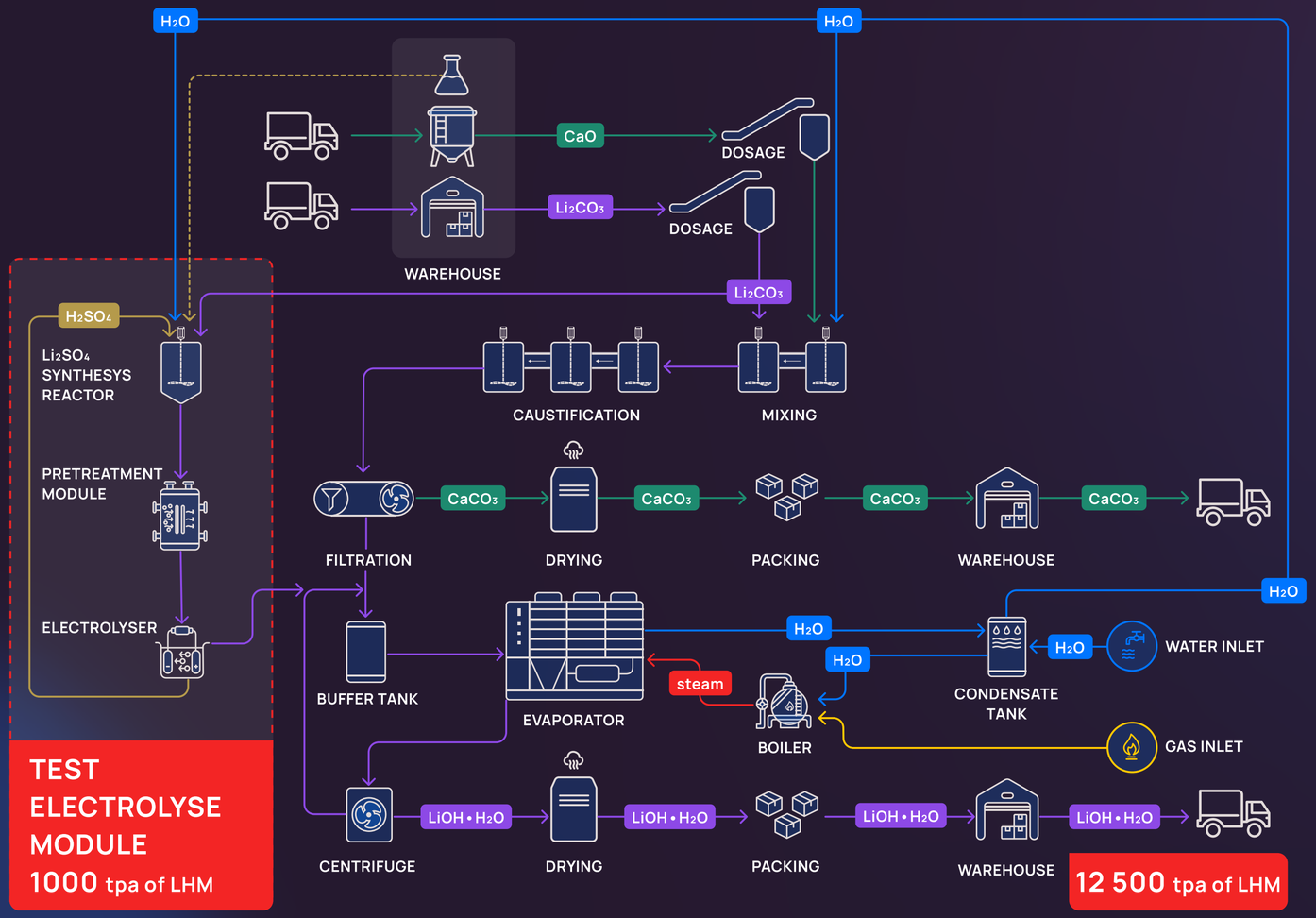
We use a well-known & efficiency proven **lime-based conversion technology**.

The modern automation system provide the permanent control for the 1000+ parameters ensuring the highest operating efficiency and product quality and complying to safety and ecological standards.

Our technology is based on a **closed-loop water circuit** that minimizes water consumption and eliminates wastewater discharge to the environment. Advanced air purification systems further minimize emissions of harmful substances into the atmosphere.

To reduce energy consumption we use **Mechanical Vapor Recompression** (MVR), a modern energy-saving technology based on reusing the energy of process vapor.

Partnership and Innovations



In partnership with **HELM AG** in 2026 we will test **electrolyses technology** of Li_2SO_4 to LiOH conversion.

After 3 years of laboratory research, the technology is ready for a long-time industrial scale application test – with an estimated capacity 1000 tpa of LHM.

In October 2025 we received **environmental permit** to test that technology and results will be demonstrated next year.

Application of that technology promise high benefits in **cooperation with recycling plants** who convert black mass to lithium sulfate.

LevertonHELM Current Operation

	Location	Capacity	Features	Main Products
	Sherrington, Basingstoke, UK	1 kTA LCE[1]	Multi-Purpose Production & R&D	Inorganic Lithium Specialities
	Houndmills, Basingstoke, UK	4 kTA LCE[1]	Blending & Milling; Lithium Chloride Recycling	Lithium Carbonate – Technical & Battery Grade
	Viables, Basingstoke, UK	4 kTA LCE[1]	Dedicated Lithium Chloride Production	High Purity Lithium Chloride

[1] LCE = Lithium Carbonate Equivalent

LevertonHELM

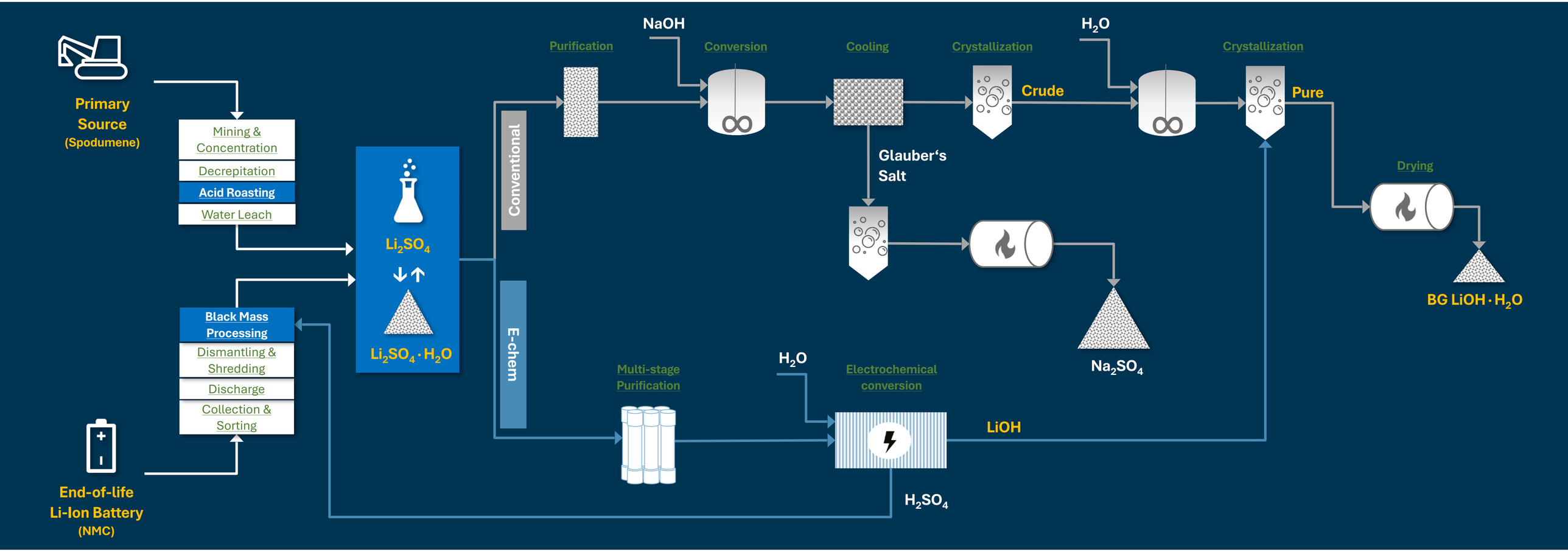
Our Products Today

HELM manufactures a wide range of inorganic Lithium chemicals to meet diverse industry needs

Lithium

Lithium Carbonate Technical Grade & Battery Grade	**Lithium** Hydroxide Technical Grade & Anhydrous	**Lithium** Chloride
Lithium Sulphate	**Lithium** Bromide	**Lithium** Nitrate
Lithium Acetate	**Lithium** Citrate	**Customized** **Lithium** speciality salts

Why is a new conversion route needed?



E-chem Route

Sustainable technology

- ✓ Very low CO_2 FP when powered by green electricity
- ✓ Very low level of chemical reagents is needed
- ✓ Valuable by-product (H_2SO_4) to close the loop

Substantial cost advantage at commercial scale

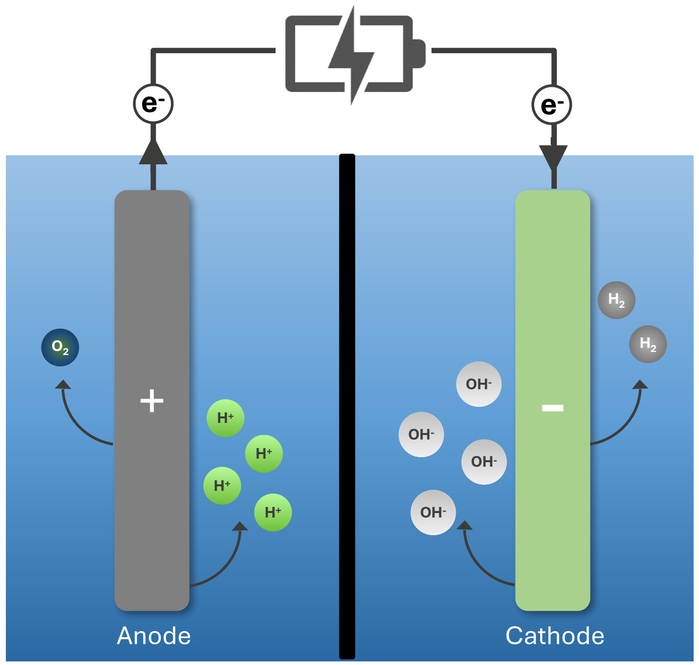
- ✓ Very high Li-recovery
- ✓ Easy scale up (modular units)

Challenges

- ✗ Demonstrate technology with 5 kt plant before commercial scale
- ✗ Install a robust and versatile feed purification process

How does it work?

Electrochemical Water Splitting



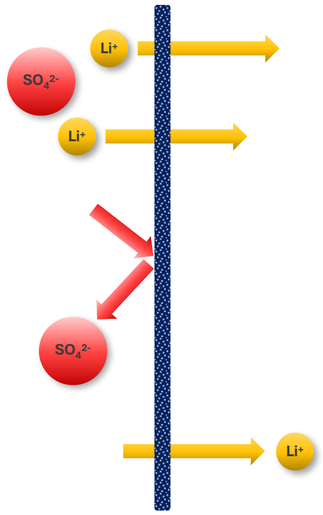
$2H_2O \rightarrow O_2 + 4H^+ + 4e^-$

$4H_2O + 4e^- \rightarrow 2H_2 + 4OH^-$

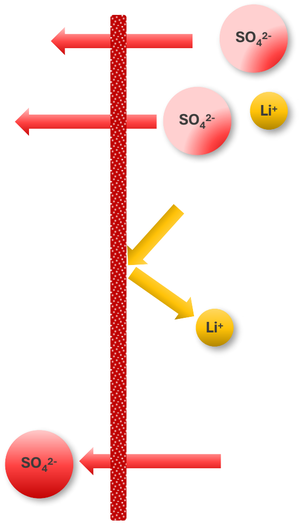
Electrolysis:
Chemical reaction enforced by electricity

Ion Selective Membranes

CEM
Cation Exchange Membrane

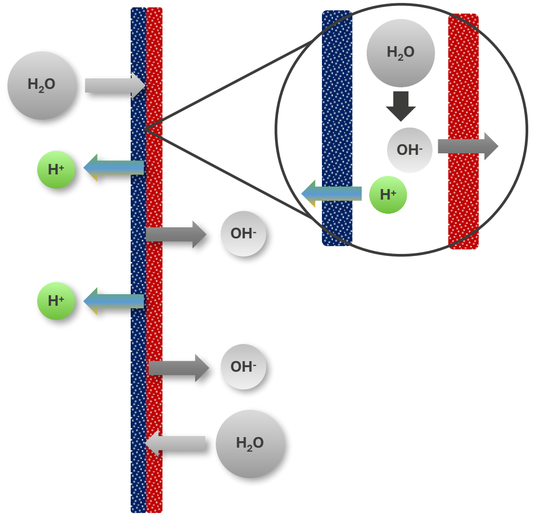


AEM
Anion Exchange Membrane



Ion-selective membranes:
Selectively permeable to either negatively or positively charged ions

BPM
Bipolar Membrane

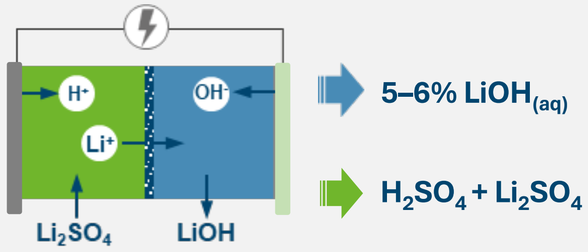


Bipolar membranes:
Composite membrane using natural water dissociation and ion selective permeation

Technology setup

Identified 3 Technology Options with different Strengths (✓) and Weaknesses (✗)

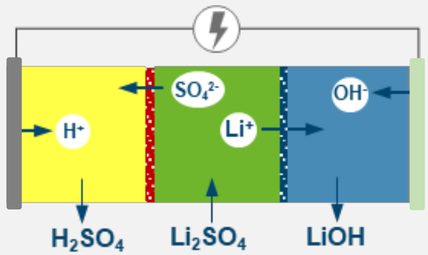
2-chamber Electrolysis



5–6% $LiOH_{(aq)}$

$H_2SO_4 + Li_2SO_4$

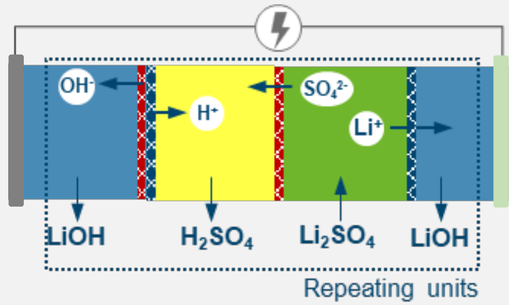
3-chamber Electrodialysis



5–6% $LiOH_{(aq)}$

7–8 % H_2SO_4

Electrodialysis with Bipolar Membrane (BPED)



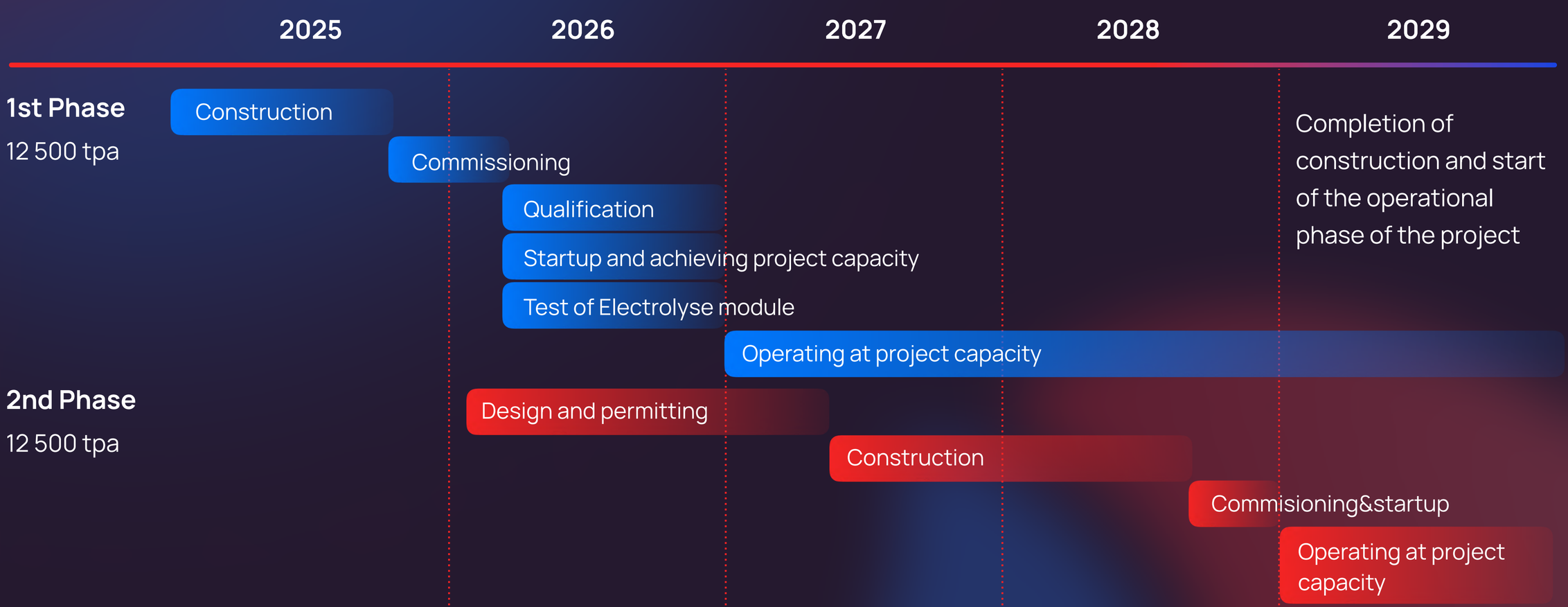
2–4% $LiOH_{(aq)}$

3–8 % H_2SO_4

Electrical driven → **Membrane driven**

✓ High LiOH purity	✓ High LiOH purity	✓ Lower electrical energy consumption
✓ Commercial technology adaption from well established chlor-alkali-electrolysis	✓ **Valuable, high purity H_2SO_4 co-product**	✓ Lower CAPEX
✓ Proven **CEM** materials	✓ **Highest Li-conversion efficiency (99%)**	✓ High Li-conversion efficiency (94%)
✓ Demonstrated for Li_2SO_4 in 500 tpa scale		✓ Recently proved at industrial scale (> 10 ktpa) in Argentina.
✗ **Low Li-conversion efficiency (72%)**	✗ Higher electrical energy consumption	✗ **Lower LiOH purity & concentration**
✗ Acidic, weak brine byproduct needs further processing & Li recovery	✗ Less mature **AEM** technology risks higher OPEX	✗ **Lower H_2SO_4 co-product purity**
		✗ High maintenance costs (many membranes)

Project timeline: next steps



Thank you for your attention and cooperation!

For further inquiries, please feel free to contact:

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