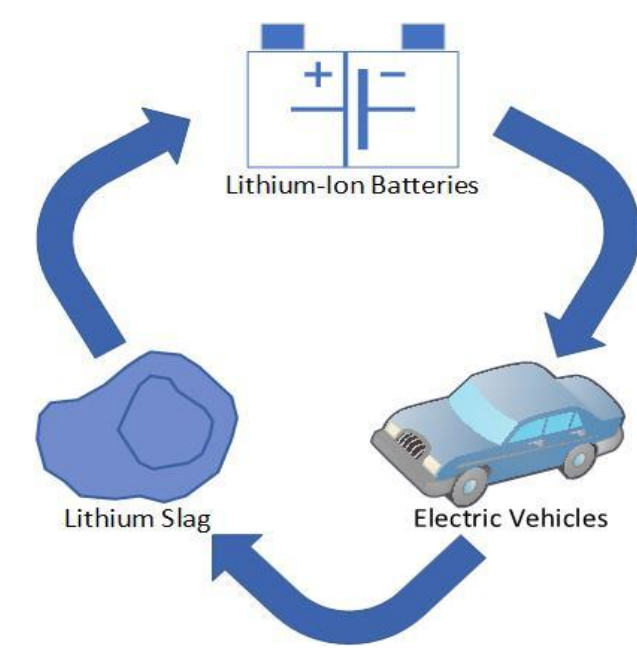


Introduction

Reduce lithium-ion battery waste produced by the increased demand in electric vehicles.

Develop a hybrid metallurgical process to create the value added products of Lithium Carbonate and Cobalt Alloy.

Invigorate the need for recycling and “urban mining” within North America.

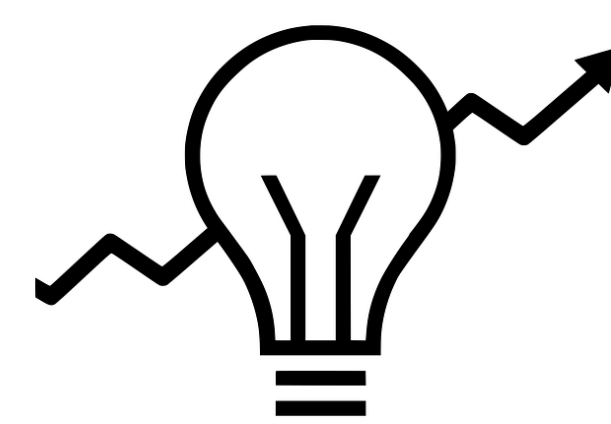


Innovation/Novelty

Scales-up lithium carbonation research to meet industrial demands.

Extracts all valuable components from lithium slag which is typically discarded.

Capable of appending to existing facilities.



Environmental Analysis



Eliminates 4500 tonnes of EV battery waste per year

56.3 kg/hr of GHG emissions

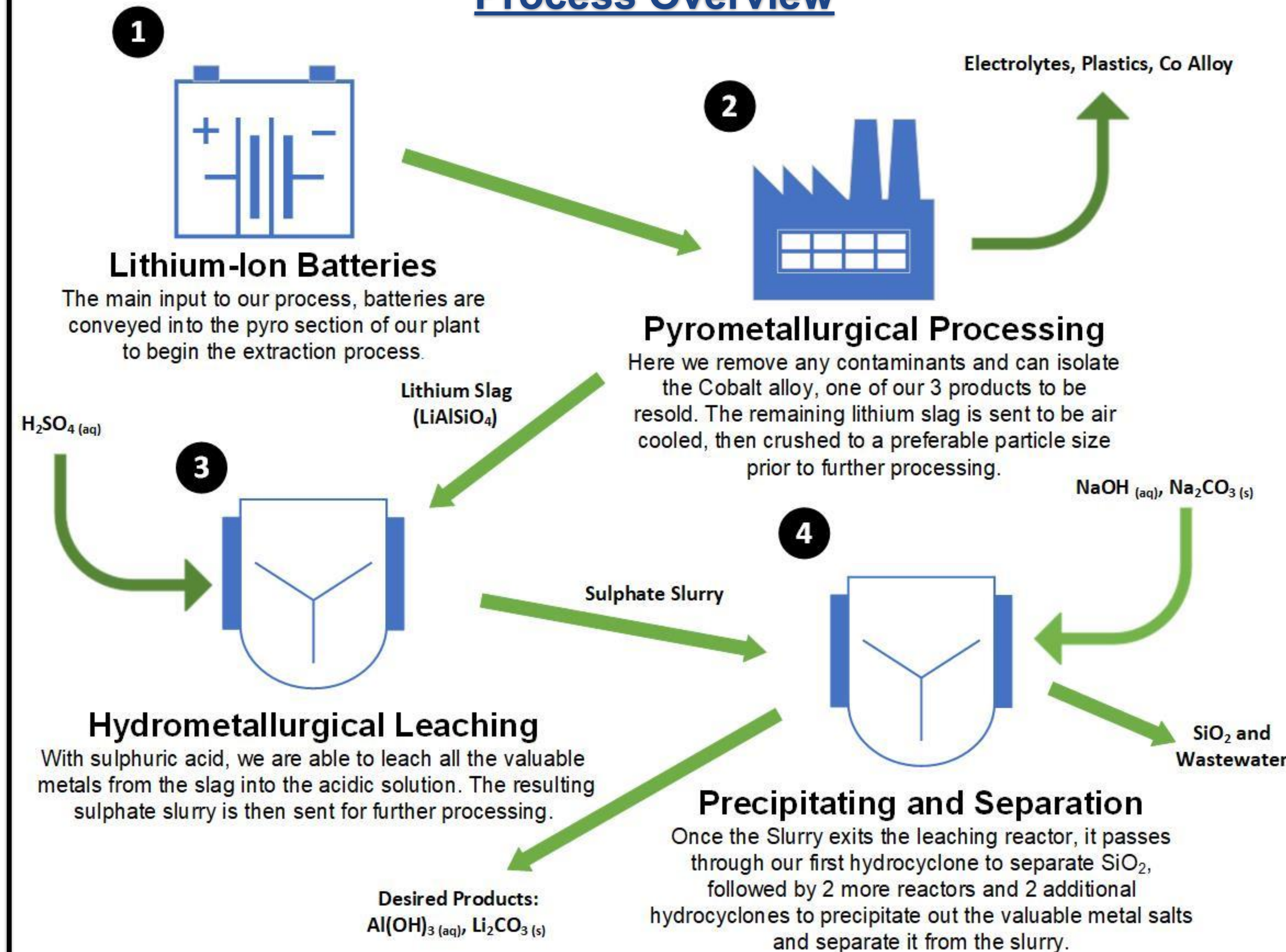


Sulphates discharge of 975 ppm (<5000 ppm regulations)

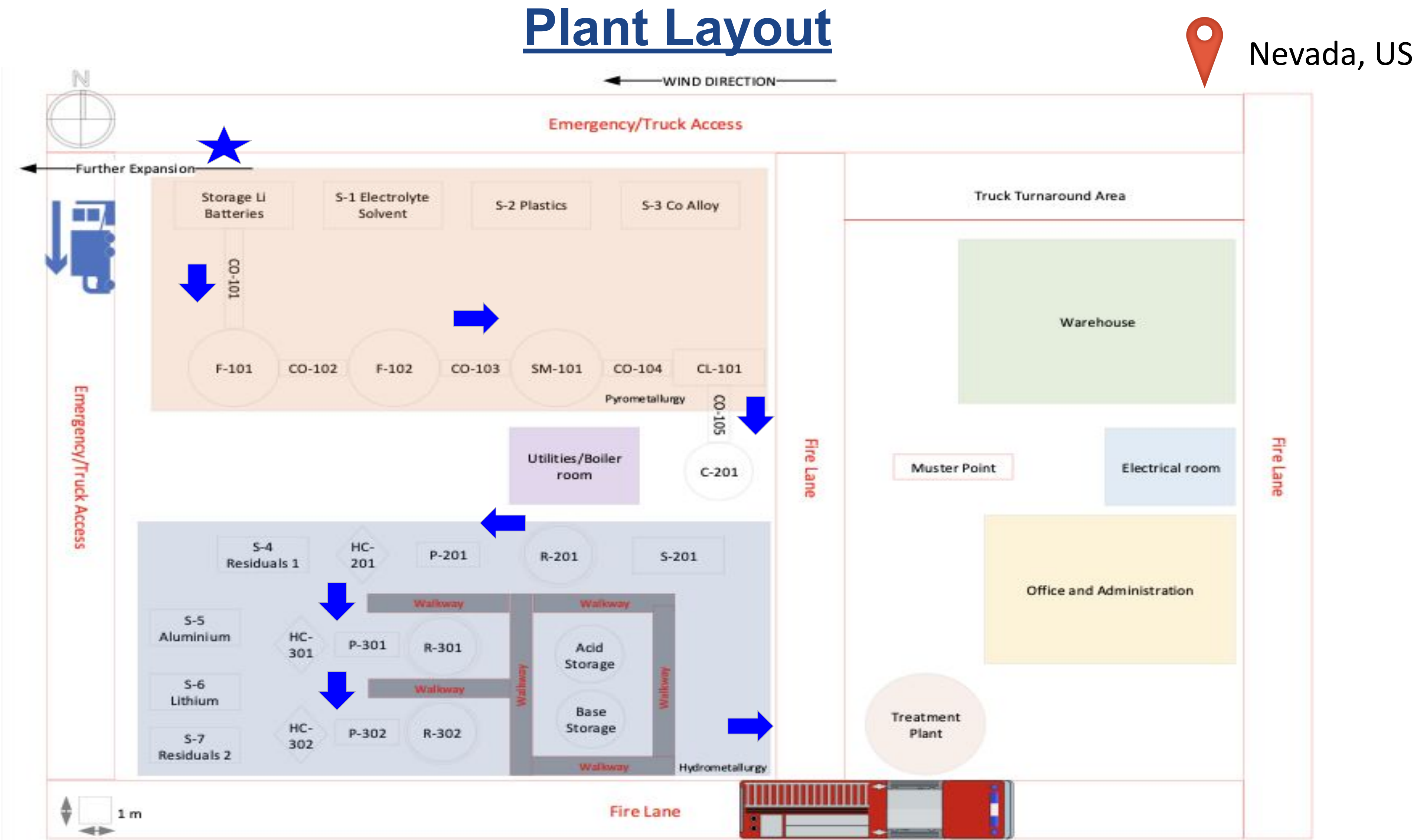
Plant designed with reactor spill guards and emergency sump lines



Process Overview

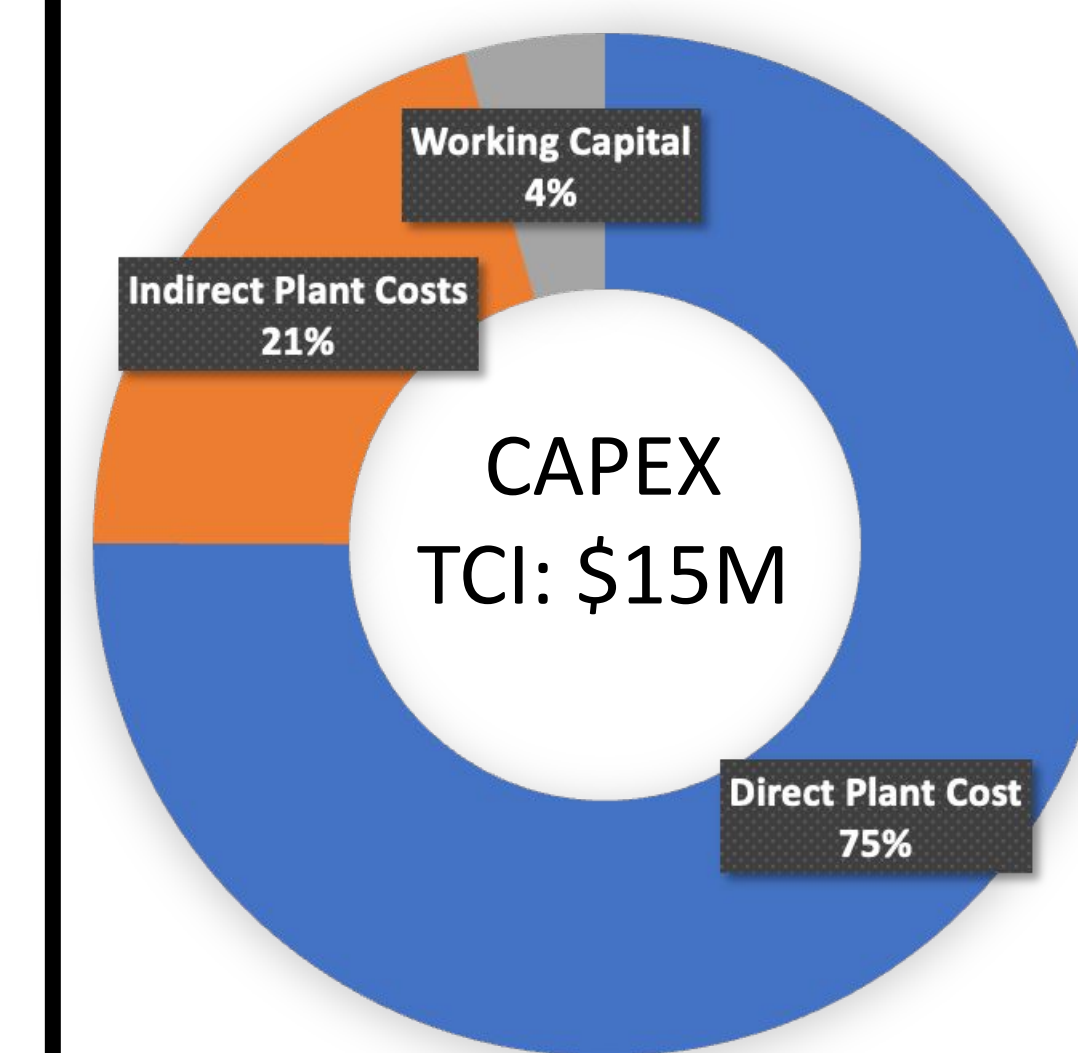


Plant Layout



Economics Analysis

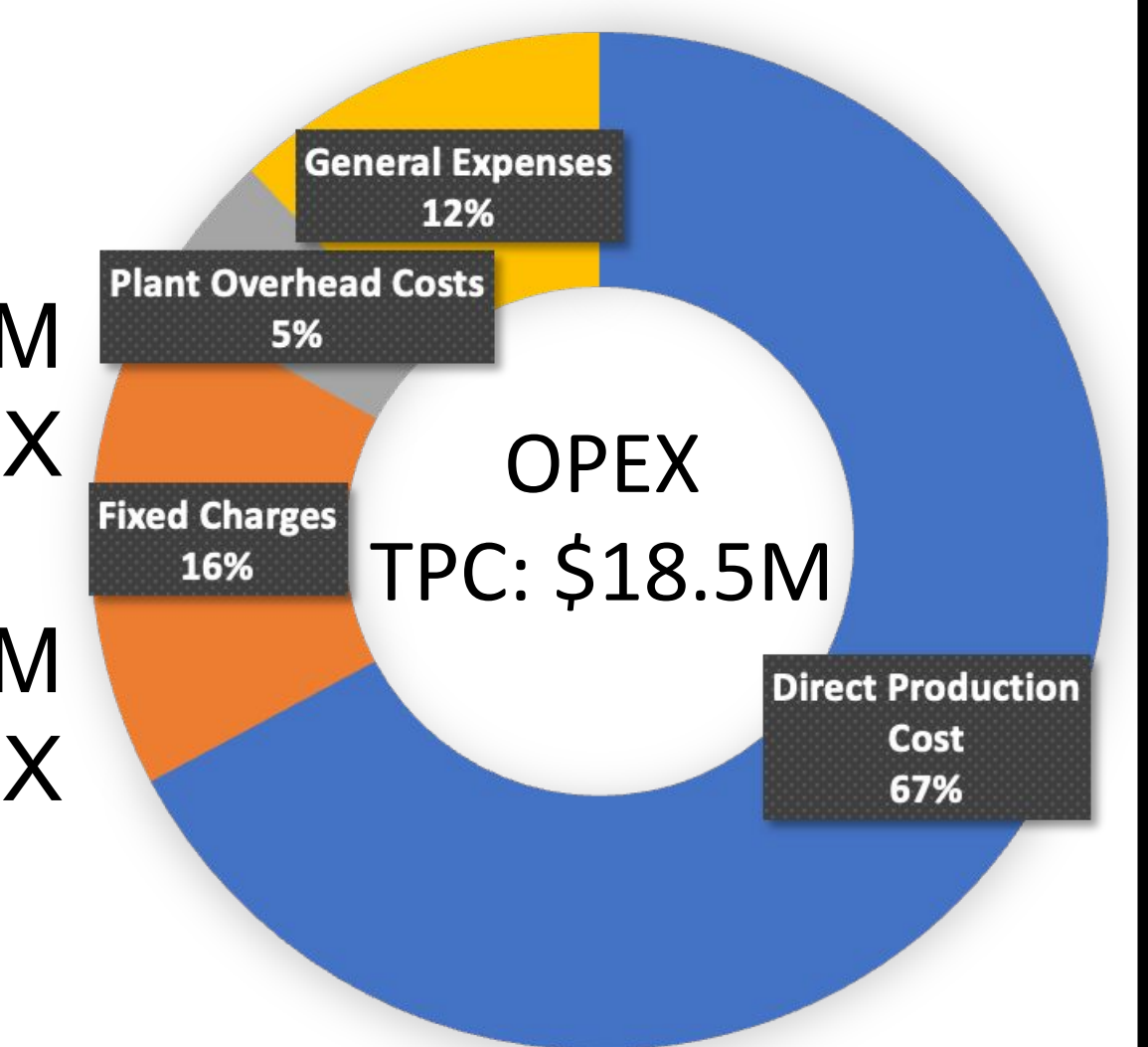
Total Capital Investments



FCI: US\$14 M
WC: US\$666K

Equipment Cost: US\$2M
13.3% of CAPEX

Total Product Cost



Raw Material: US\$2.5M
13.5% OPEX

Labour Costs: US\$7.8M
42.1% OPEX

ROR: 45.1%

Payback Period: 2 years

Raw Material Profit (Year 1): US\$30M
Based on Present Value Estimation

Minimum Raw Material Benefit: US\$17

Global manufacturing of EVs is expected to reach 25.3 M units by 2030

Yearly ~18% increase in Lithium Prices

Acknowledgements

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