Lithium Extraction and Purification from Geothermal Brine

(Technical Report)

The Fight for Water:
How Indigenous Chileans and Lithium Corporations Compete

(STS Research Paper)

An Undergraduate Thesis Portfolio
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Preface

How can a transition to more sustainable energy systems be achieved? Current technological research is electing solutions to enable the green energy transition.

How can Lithium Hydroxide be produced from waste brine in geothermal energy plants? A novel sorbent can separate lithium from brine extracted from California's Salton Sea. Lithium is converted to Lithium Hydroxide through an electrochemical reaction. The project team designed postprocessing lithium extraction units for existing geothermal energy plants in the region. If implemented at scale, such a process could support a domestic industry that would supply lithium to meet rising demand for batteries at a lower environmental cost. The location will create a stable, profitable national lithium industry. An economic evaluation indicates that this process will be competitive in global markets.

How do proponents and critics of lithium extraction in Chile advance their agendas? Chile has long faced a dilemma between prosperity from mining and the environmental damage left in its wake. Mining's environmental effects threaten local communities and ecosystems, yet mining profits have enabled a national increase in quality of life. Advocates and critics of lithium extraction employ litigation, protests, social and public media, and coalition building to raise support for their cause. The debate is dynamic; it is influenced by political developments, social media trends, and global pressure for increased lithium production.