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California has long been a leader in advancing new clean energy technologies, many of which require critical minerals such as lithium in their manufacturing. Now the state is positioned to become a leading source of lithium through a process developed to recover lithium from geothermal brines in the Salton Sea region, an opportunity referred to as “Lithium Valley.”

Lithium’s Role in a Clean Energy Future

Lithium is considered by the U.S. government to be one of 35 critical minerals vital to the nation’s security and economic prosperity. Global lithium demand is expected to grow substantially in the next decade, driven largely by increasing demand for lithium-ion batteries in electric vehicles and energy storage projects for the electricity sector. These technologies are also key to the state’s clean energy and transportation goals.

- California surpassed 1 million electric vehicles sold in 2021 and is on the path to phasing out the sales of gasoline-powered vehicles by 2035.
- Global electric vehicle market growth is projected to rise from 1.7 million vehicles in 2020 to 26 million vehicles in 2030 and 54 million vehicles by 2040.
- State agencies project the need for roughly 50 gigawatts of new energy storage on the electric grid by 2045.

Project developers are identifying methods to bring lithium to the surface for recovery during the process of producing geothermal energy. This method is commonly referred to as direct lithium extraction from geothermal brines.

Currently, three developers are planning or developing projects to recover lithium from brines at existing and planned geothermal power plants in the Salton Sea region:

- BHE Renewables, is working on modifying existing geothermal power plants to incorporate co-located lithium extraction facilities
- Controlled Thermal Resources, Hell’s Kitchen Lithium and Geothermal Power Project
- EnergySource Project ATlis, Mineral Recovery co-located at the John L. Featherstone Geothermal Facility

California’s Lithium Production Opportunity

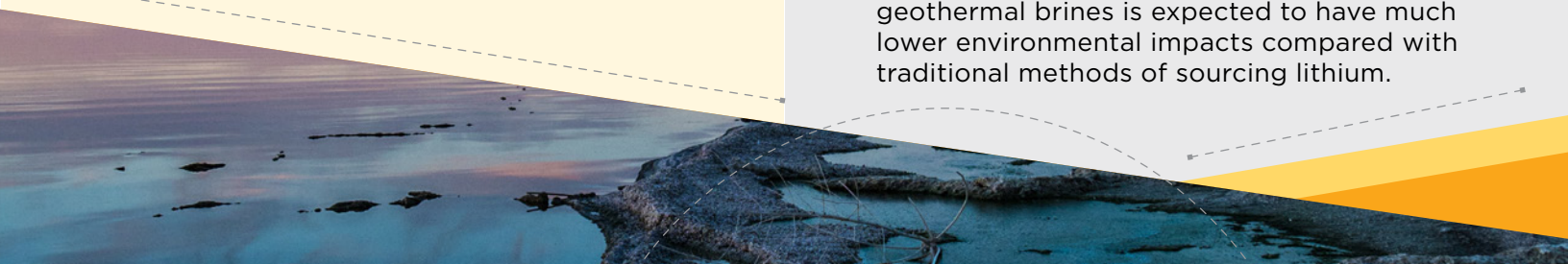
Today, 95 percent of all lithium is produced in just four countries: Australia, Chile, China and Argentina through either hard-rock mining or large evaporation ponds. These methods typically result in significant environmental impacts.

California has a substantial lithium resource contained in mineral rich saline water that lies deep underground the Salton Sea area.

Benefits of Lithium Extraction from Brines

Direct lithium extraction from geothermal brines is expected to create economic benefits for the state and region.

- Lithium recovery from geothermal brines can increase investments and tax revenues to benefit local communities.
- In-state lithium recovery and production may also lead to new manufacturing facilities across the battery supply chain.
- The direct extraction of lithium from geothermal brines is expected to have much lower environmental impacts compared with traditional methods of sourcing lithium.



California Energy Commission

The California Energy Commission (CEC) is funding lithium recovery research, development and demonstration projects as well as supporting the Lithium Valley Commission as it assesses challenges, impacts, and opportunities related to extracting lithium from geothermal brines in the Salton Sea region.

Innovation

The CEC has funded more than 20 research projects to advance innovations for lithium recovery from geothermal brines, the processing of manufacturing grade lithium and the efficient use of lithium in batteries, as well as other related research, planning and development efforts. This includes:

- Multiple awards investing more than \$10 million toward research and development of lithium recovery technologies.
- Funding for development of demonstration and pilot-scale facilities that recover lithium from geothermal brines.
- Financial and technical support for projects completing technical and economic evaluation of lithium extraction, processing and manufacturing.

Additional information on past and current CEC funding for lithium recovery and related projects:

- CalSEED www.calseed.fund/spotlight
- Energy Innovation Showcase innovation.energy.ca.gov
- Geothermal Grant and Loan Program www.energy.ca.gov/programs-and-topics/programs/geothermal-grant-and-loan-program

Lithium Valley Commission

To explore the opportunities and challenges surrounding lithium recovery from geothermal brines in the Salton Sea geothermal region, Governor Gavin Newsom signed Assembly Bill 1657 in September 2020 creating the Blue Ribbon Commission on Lithium Extraction, known as the Lithium Valley Commission.

The Lithium Valley Commission is charged with investigating and analyzing a range of related issues, in collaboration with other government agencies and members of the public. The Commission must submit a report of findings and recommendations to the state legislature by October 1, 2022.

For more information on the Lithium Valley Commission, visit:

www.energy.ca.gov/LithiumValleyCommission

For information about interpreting services or other reasonable modification and accommodations, contact (916) 957-7910 or publicadvisor@energy.ca.gov.



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