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Lithium Recovery from Geothermal Brine

4. What are the greatest technical barriers to the commercialization of lithium recovery from geothermal brine? What technologies provide the greatest opportunities to facilitate the commercialization of lithium recovery from geothermal brine? What would be the most effective use of R&D funding to advance commercialization of lithium recovery from geothermal brine? What specific technologies or approaches are presenting a particular
challenge, and what are some alternatives?

The greatest technical barrier to commercialization is the lack of sufficient lithium selectivity and long term material stability in geothermal brine. The technologies that have the most potential include: adsorption/ion exchange, and electro-driven electrochemical intercalation. The most effective use of R&D funding is to invest in direct lithium extraction technologies to achieve low environmental impact and economic lithium recovery, and to partner with the Geothermal Technology Office in US Department of Energy to work with the several teams they already identified in terms of technology development and demonstration.

5. What brine pretreatment issues have been especially challenging to overcome? What technologies or techniques have been successfully tested at a TRL of 3, 4, or 5?

Removal of silica and other silicate salts are very challenging. Some technologies have been studied, such as ion exchange and electrocoagulation, have been tested at TRL 3-5.

6. What technologies or processes can reduce waste products from the lithium recovery process
(such as by decreasing mass or by recovering additional co-products in the lithium recovery
process)? What TRL are these technologies?

Electrochemical lithium recovery (such as electrochemical intercalation and ion exchange) can effectively reduce the generation of waste products. These technologies only rely on electricity as the sole input, and therefore minimize chemical use and generation of chemical wastes. The TRLs are 3-5.