



Texas Tech University

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To whom it may concern:

We are pleased to submit our project entitled “***Intensified Membrane Distillation Crystallization-Nanofiltration (iMDC-NF) for Direct Lithium Extraction***” to the United States (US) Department of Energy Geothermal Lithium Extraction Prize.

Lithium is a critical element in the production of batteries and electricity storage in the US, essential for reducing US dependence on fossil fuels through the development of electronic devices and grid storage applications. However, non-conventional domestic lithium reserves such as geothermal brines are highly complex matrices which require specialized approaches for selective lithium extraction and which may be cost-prohibitive. The proposed work addresses these barriers to lithium extraction from geothermal brines using an integrated membrane distillation – nanofiltration approach developed by our team at Texas Tech University.

The scope of the proposed work includes enriching the lithium brine concentration using membrane distillation, developing a nanofiltration membrane that is optimized for selective lithium extraction, integrating and pilot testing membrane distillation and nanofiltration components at the lab bench scale, and a preliminary life cycle assessment of our combined technology. We expect our proposed project will lead to the development of a membrane distillation-nanofiltration technology that is scalable for use at large flow rates.

Thank you for your time and consideration.

Sincerely,

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Innovation tag line: DLE with intensified membrane-based process

[Link to your 90-second video](https://www.youtube.com/watch?v=BYctIXMPfi0) : <https://www.youtube.com/watch?v=BYctIXMPfi0>

Connectors:

- Department of Energy (EERE-AMO)
- AIChE RAPID Institute
- National Science Foundation