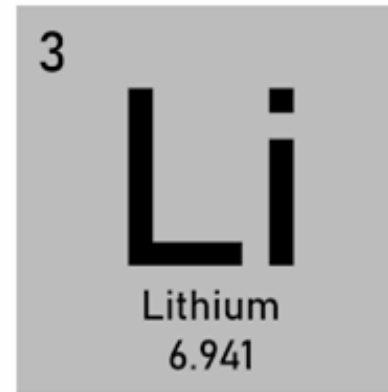
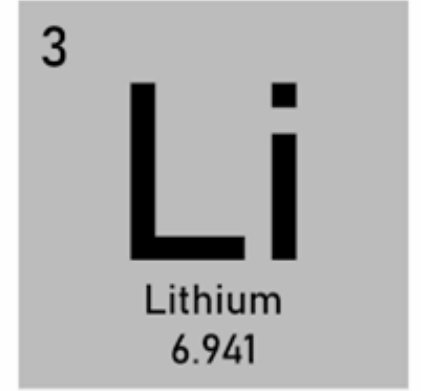
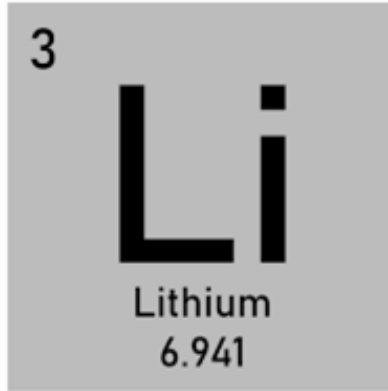
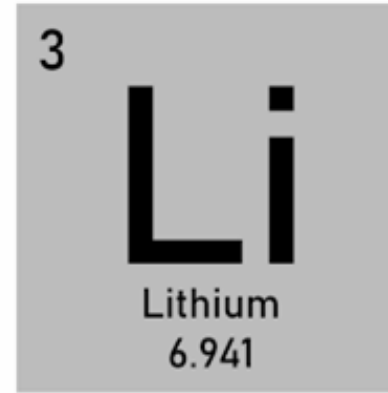
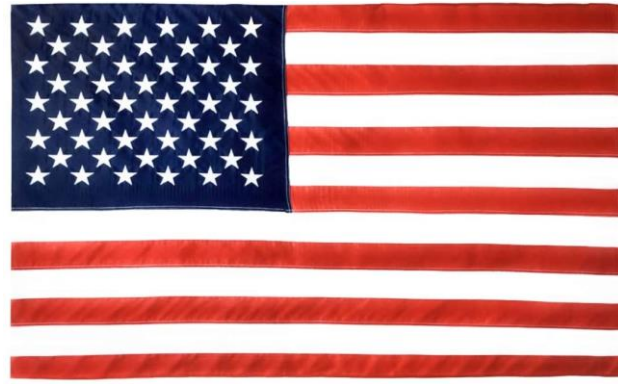


American Lithium Resource Opportunities



Alex Grant

Principal, Jade Cove Partners

✉ ag@jadecove.com

🌐 www.jadecove.com/research

🐦 [alexjadecove](https://twitter.com/alexjadecove)

US Energy Association

19 November 2020

Overview of Jade Cove Partners






Jade Cove partners with project developers, investors, governments, technology companies and other stakeholders to evaluate the **technical feasibility, environmental impacts, and economic potential of new projects and technologies in the materials, mining, renewable energy, and water industries**. Jade Cove provides clear, actionable insights for making complex technology investment decisions informed by extensive original technical research.

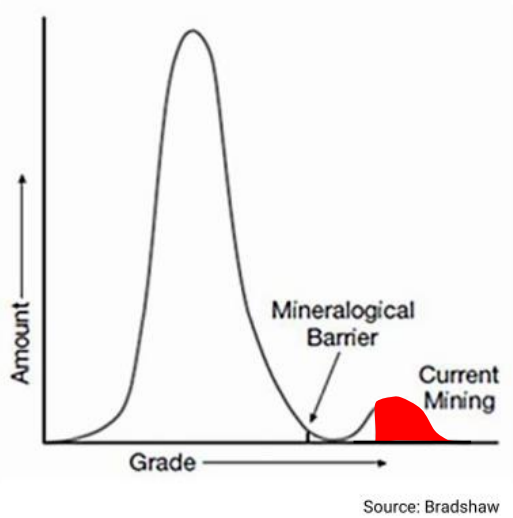
I work at the nexus of i) **technology development** and deployment, ii) **environmental impact quantification** and mitigation, and iii) lithium natural **resource development**.



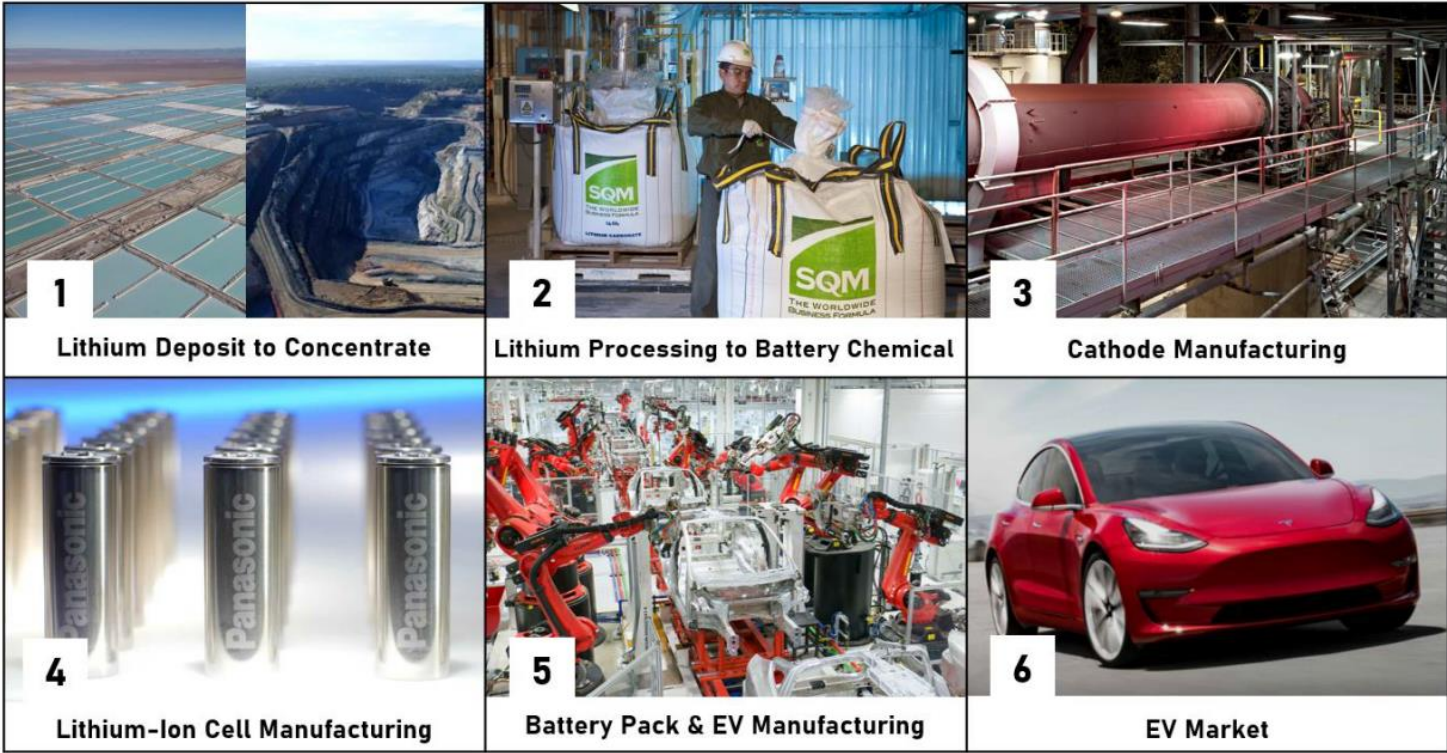
Lithium-Ion Battery Supply Chain Overview

In the Ground: The Types of Lithium Natural Resources

Pegmatites	Sedimentary Deposits	Brines
<div>Spodumene</div> <div>Lepidolite</div> <div>Petalite</div> <div>Zinnwaldite</div> <div>Amblygonite</div> <div>Eucryptite</div> <div>Zabuyelite</div>	<div>Smectites</div> <div>Illites</div> <div>Jadarite</div> <div>Searlesite</div> <div>Combinations & Others</div>	<div>Salars</div> <div>Oilfield/Continental</div> <div>Geothermal</div> <div>Ocean</div>
		

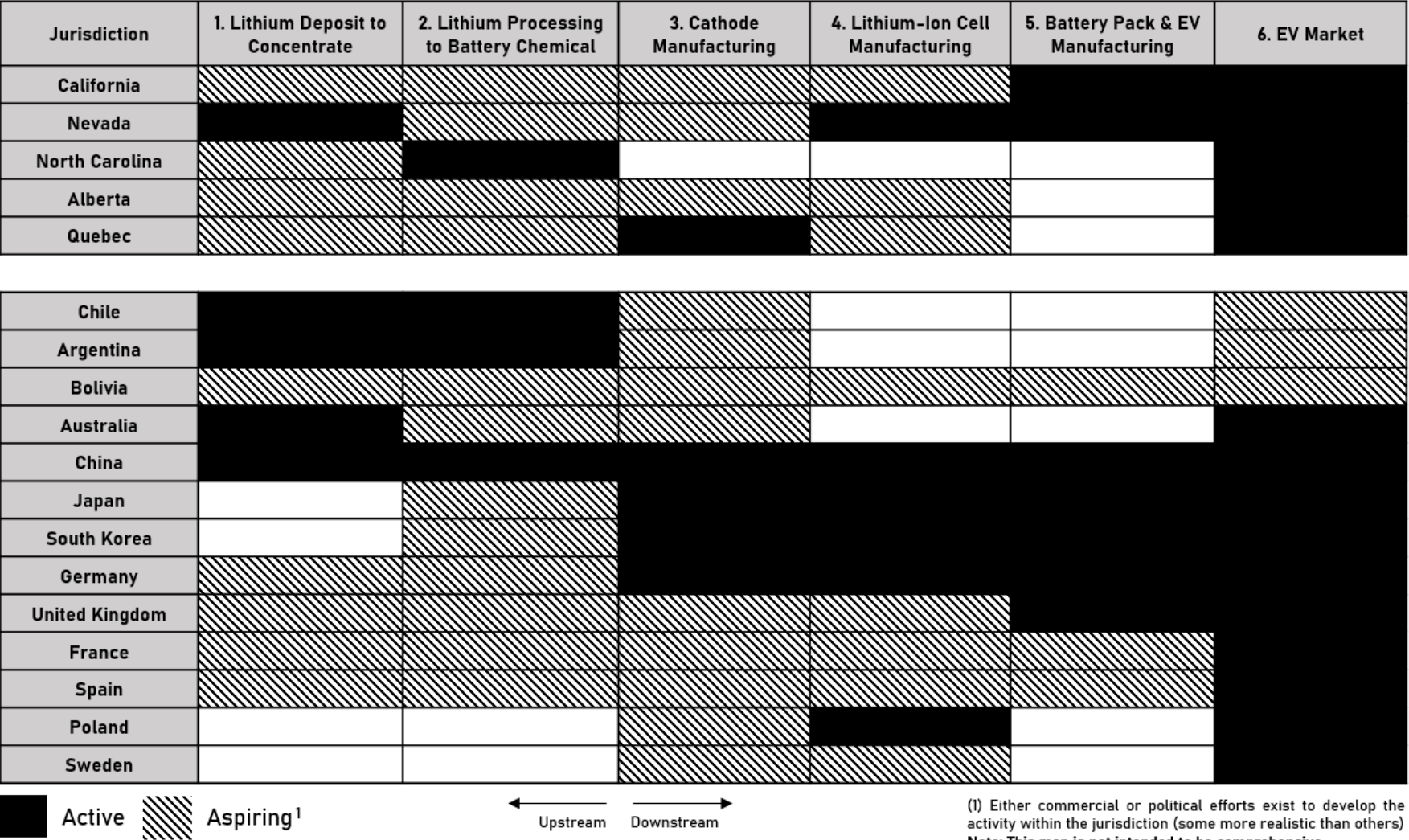


From Ground to Garage: The Lithium Atom's Journey



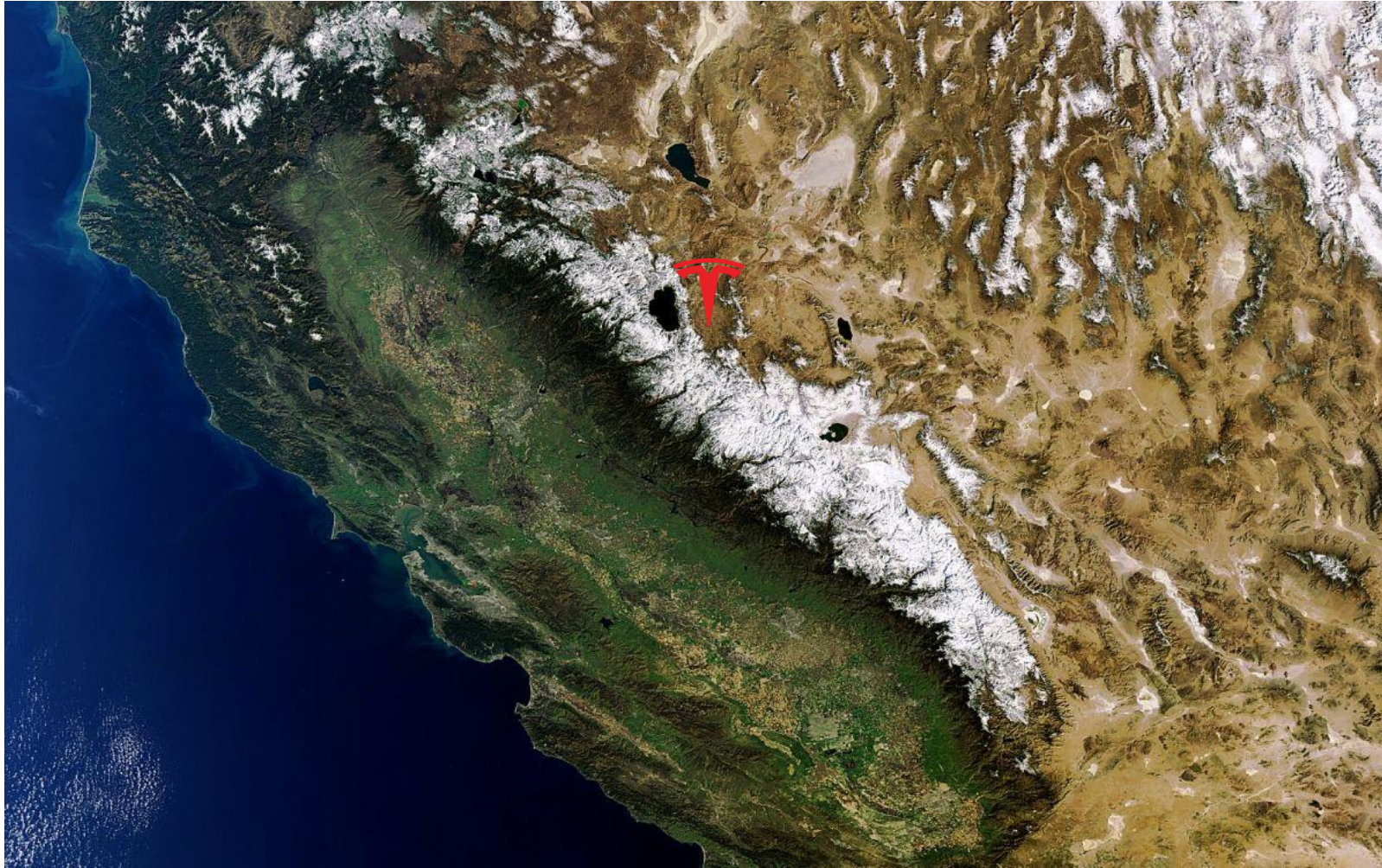
Global State of Play Today

Simplified Map of Significant Participation in the Current, Global Lithium-Ion Battery Supply Chain – June 2020



Where Does The US Stand?

Large-Scale Cathode Manufacturing in the US: Coming Soon?



Tesla's secret Roadrunner project: new battery production at \$100 per kWh on a massive scale

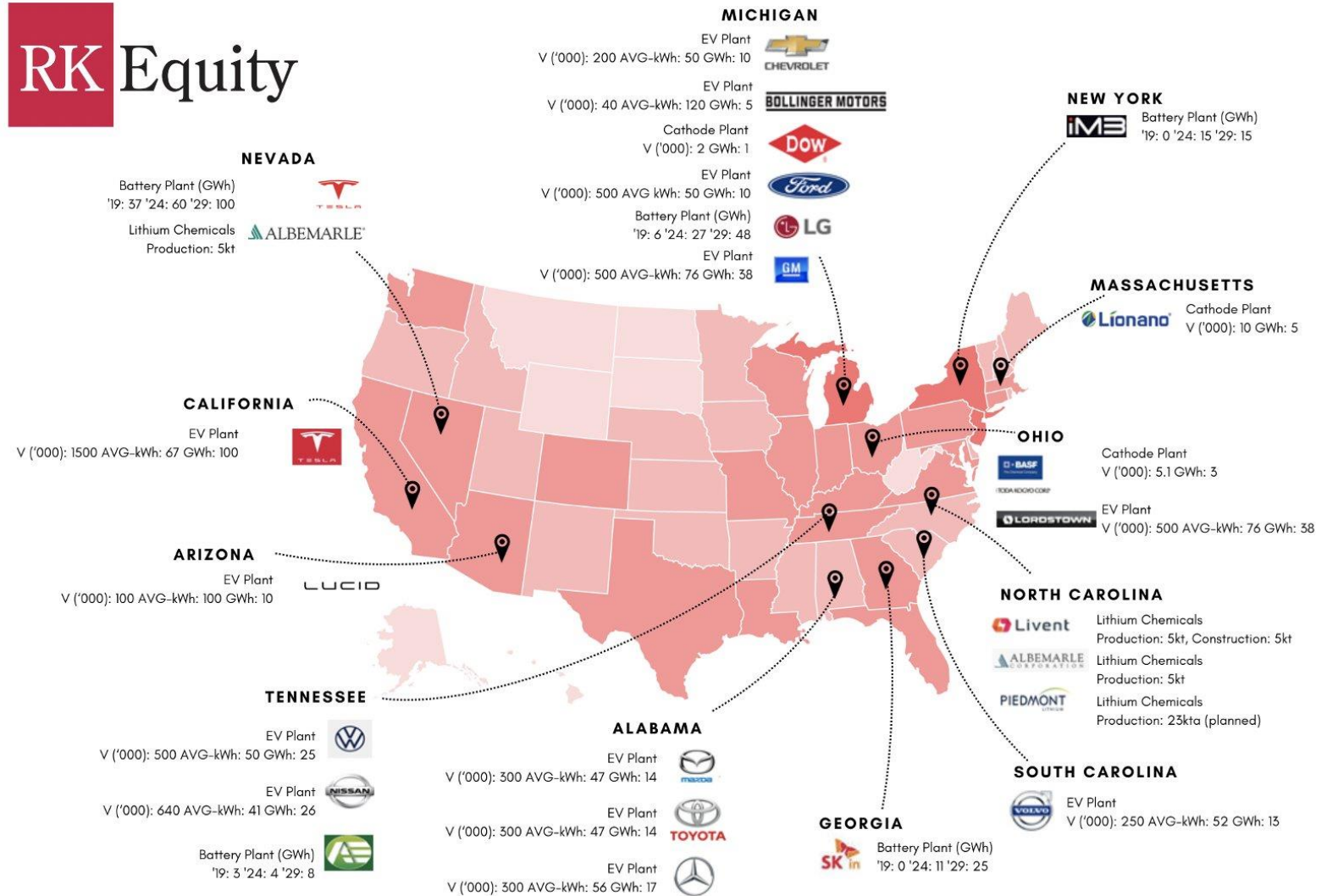
Fred Lambert - Feb. 26th 2020 3:49 pm ET @FredericLambert

EXCLUSIVES



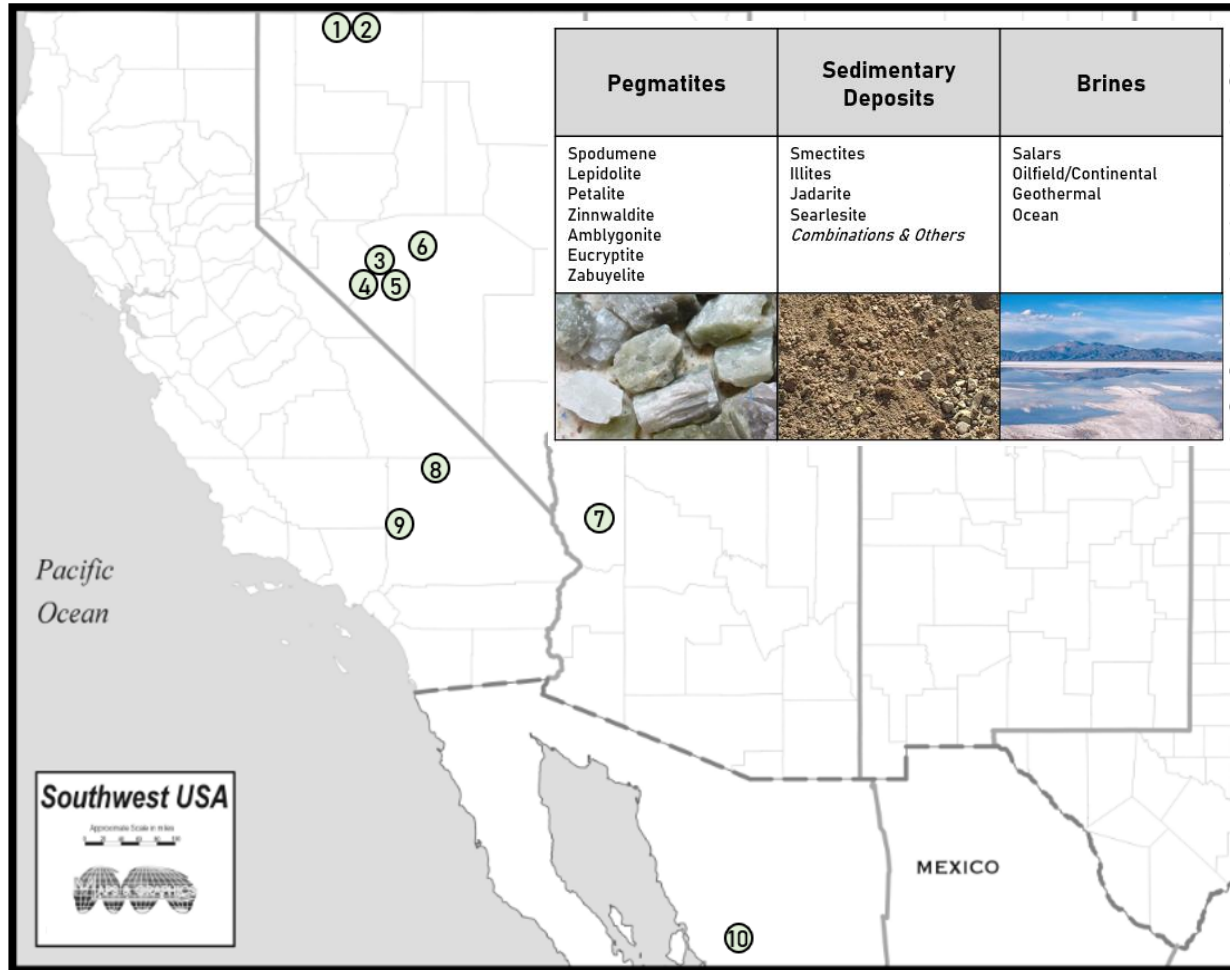
The Broader Opportunity

- More Tesla Gigafactories
(Texas/Oklahoma (?) Gigafactory)
- Other EV manufacturers setting up shop from Arizona to Massachusetts
- European EV manufacturing

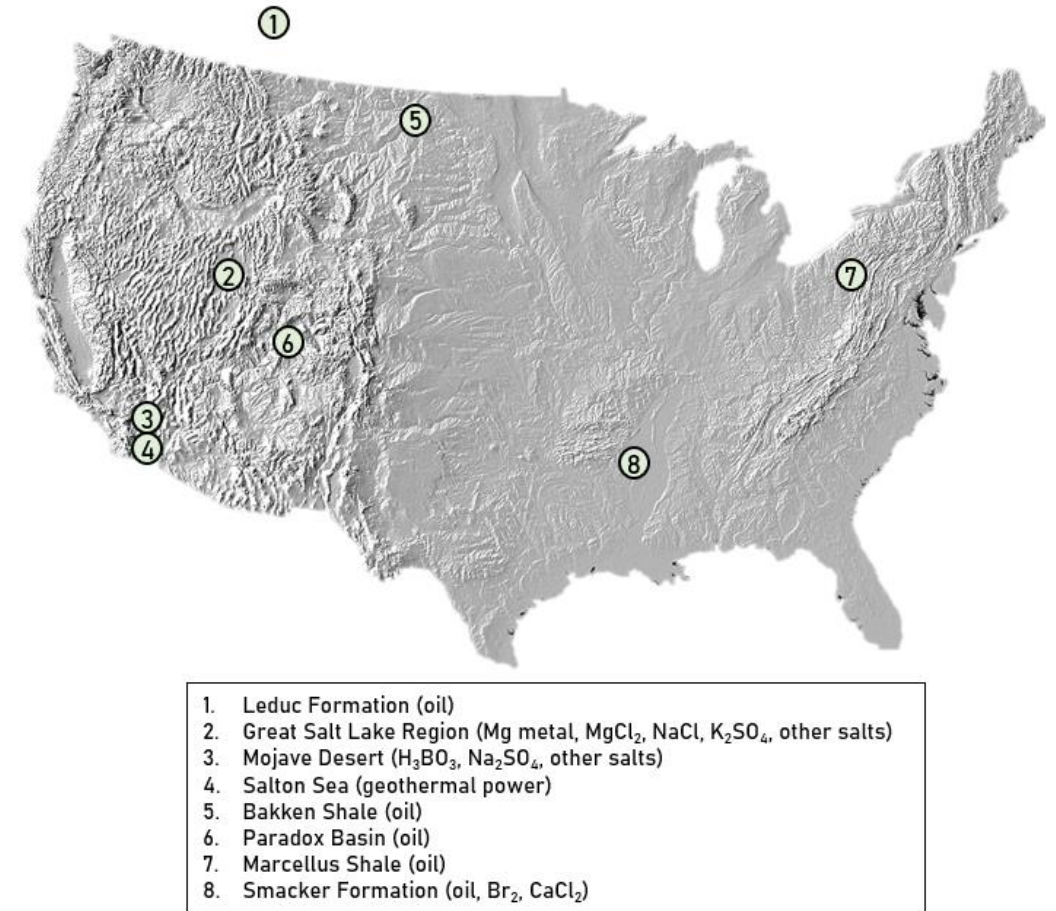


The US is Rich in Lithium Resources

The Western Sedimentary Lithium Projects – October 2019

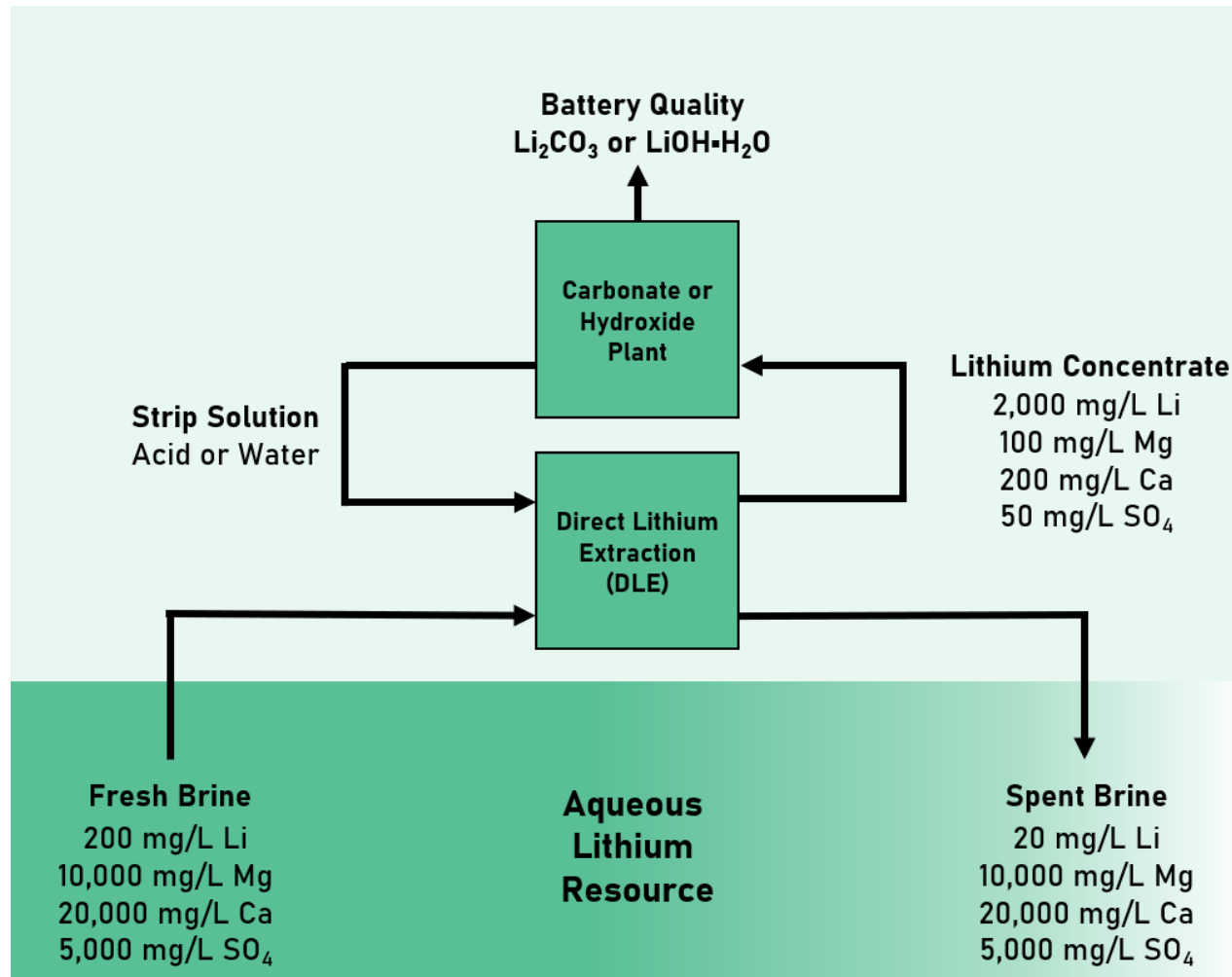


North American Brownfield Lithium Brine Potential Opportunities – November 2019



And don't forget the Carolinas' Tin-Spodumene Belt

And Leading in New Extraction Technologies



Direct Lithium Extraction (DLE) is used in Argentina and China, but originally developed by Dow Chemical for American oilfield brines.

Minimize costs of production by:

- Minimizing energy consumption
- Minimizing reagent consumption
- Minimizing water consumption
- Minimizing waste production



Some of September's Tesla Battery Day Revelations



ASX RELEASE | September 28, 2020 | ASX: PLL; NASDAQ: PLL

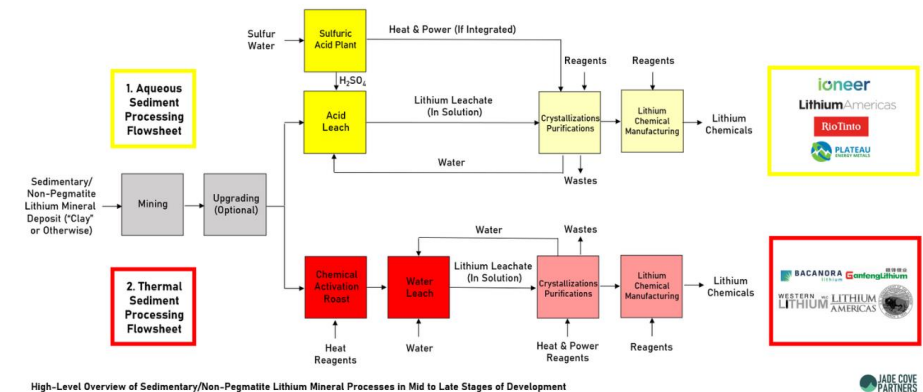
PIEDMONT LITHIUM SIGNS SALES AGREEMENT WITH TESLA

- Piedmont enters into binding sales agreement to supply spodumene concentrate to Tesla
- Five-year fixed-price binding agreement with optional five-year extension
- Agreement confirms the strategic nature of Piedmont's unique American spodumene deposit
- Discussions are ongoing with respect to other lithium and by-product sales arrangements

Tesla seems to be building a **spodumene concentrate to $\text{LiOH} \cdot \text{H}_2\text{O}$ refinery** in Texas using North Carolina feedstock



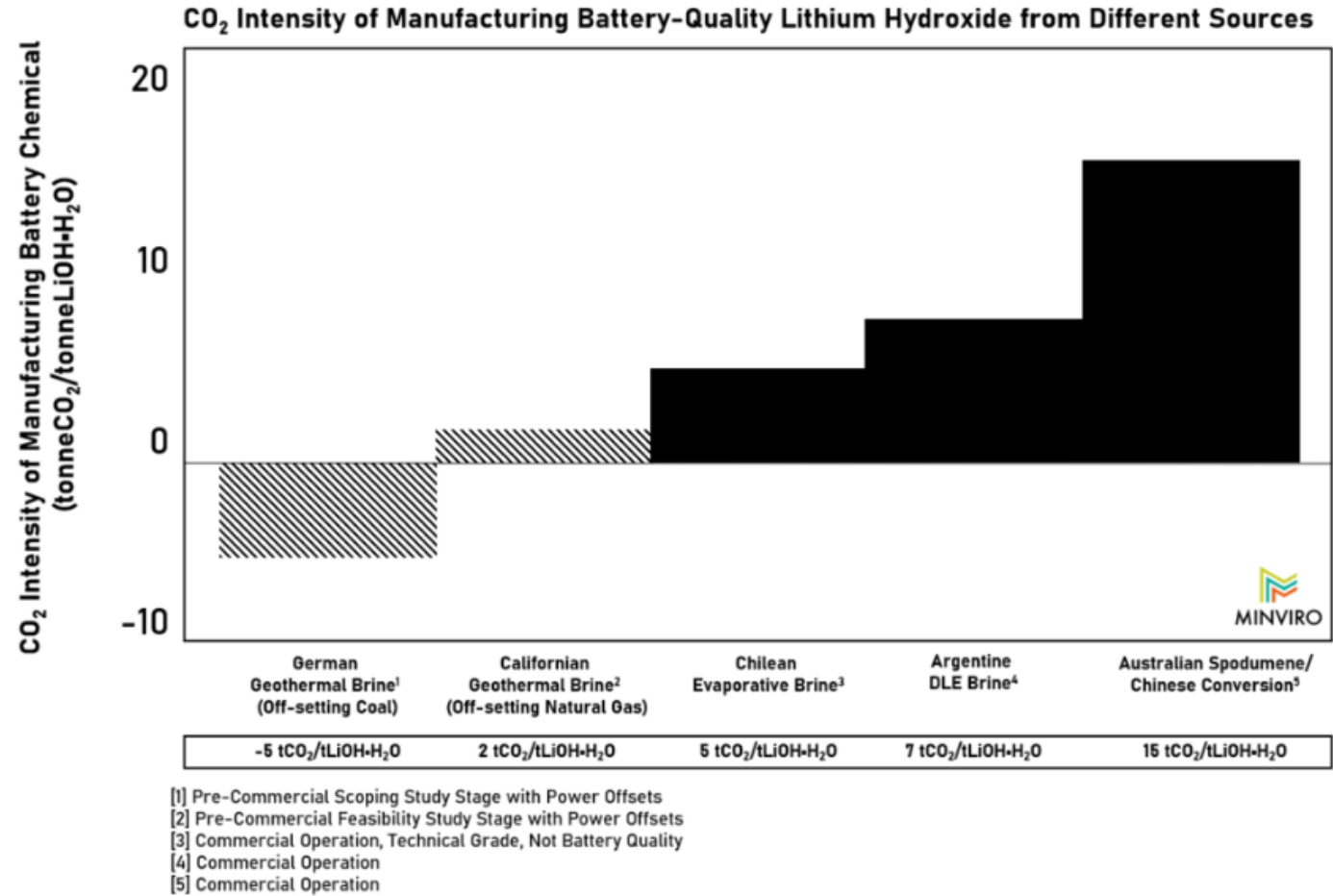
And developing **unique process flowsheets** for lithium extraction from **sedimentary clays**



Life Cycle Assessment (LCA) in Lithium Extraction & Process

LCA is a critical tool for quantifying the environmental impacts of critical material extraction and processing. At Minviro, we have done extensive LCA modeling of lithium chemical processing to identify the CO₂ intensity of manufacturing lithium from various types of natural resources via various process routes.

This modeling is being incorporated into process design & engineering, investors' priorities, and buyers' strategies to reduce the impacts of their battery bill of materials.



American Lithium Resource Opportunities

Please feel free to reach out to ask
any further questions!

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