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<td><strong>Submission Date:</strong></td>
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California’s Lithium Recovery Initiative Symposium

Schedule:
• 1:00 - 1:30 Registration and Networking
• 1:30 - 1:45 Welcome and Opening Remarks
• 1:45 - 2:15 Presentations: Innovation and Support
• 2:15 - 2:45 Presentations: Market Opportunity
• 2:45 - 3:00 Break
• 3:00 - 3:30 Panel: Supply
• 3:30 - 4:00 Panel: Demand
• 4:00 - 4:30 Panel: Execution and Regulation
• 4:30 - 5:00 Closing Remarks and Networking
Welcome and Opening Remarks

California’s Lithium Recovery Initiative Symposium

- Chair David Hochschild, California Energy Commission
- Tyson Eckerle, Deputy Director, ZEV Market Development, Office of Business and Economic Development (GO-Biz)
Innovation and Support

California's Lithium Recovery Initiative Symposium

Elisabeth de Jong
February 12, 2020
Geothermal Grant and Loan Program
California Energy Commission
Geothermal Opportunities

- Geothermal power plant development
- Mineral coproduction

Dawn, Salton Sea Geothermal Field
Image Credit: Mike Krahmer
Lithium Worldwide

Lithium Deposits
• Lithium Producer Type
  + Evaporation Ponds
  ★ Geothermal Brine
  ♦ Hard Rock

Lithium Resources per Country

<table>
<thead>
<tr>
<th>Country</th>
<th>Resources (Tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>500,000</td>
</tr>
<tr>
<td></td>
<td>1,000,000</td>
</tr>
<tr>
<td></td>
<td>5,000,000</td>
</tr>
<tr>
<td></td>
<td>10,000,000</td>
</tr>
<tr>
<td></td>
<td>15,000,000</td>
</tr>
</tbody>
</table>

Lithium Production per Country
(Pure Lithium Content Tonnes)

<table>
<thead>
<tr>
<th>Country</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 1,600</td>
</tr>
<tr>
<td></td>
<td>≤ 3,500</td>
</tr>
<tr>
<td></td>
<td>≤ 8,000</td>
</tr>
<tr>
<td></td>
<td>≤ 16,000</td>
</tr>
<tr>
<td></td>
<td>≤ 51,000</td>
</tr>
</tbody>
</table>

[Map showing lithium deposits and production around the world]
Lithium in California

[Map showing lithium deposits and geothermal power plants in California.]
Lithium in Salton Sea Area
Benefits of CA-Sourced Lithium

- Supports Geothermal Development
- Smaller Footprint, Lower Water Intensity
- Integrated Renewable Generation
- Offers National Security in Lithium Supply
- Shorter Production Time
- Economic Development in Disadvantaged Communities

Geothermal Power Plant
Image Credit: Mike Krahmer

Evaporation Ponds
Salar de Atacama
Image Credit: NASA

Hard Rock
Greenbushes
Image Credit: Google Earth
California’s Lithium Recovery Initiative

- CEC Support
  - Facilitated events on lithium recovery development
  - Funding from Geothermal Grant and Loan Program
  - Funding from Electric Program Investment Charge (EPIC)
Thank You!

Elisabeth de Jong
Elisabeth.deJong@energy.ca.gov
February 12, 2020
Geothermal Grant and Loan Program
California Energy Commission
California’s Leadership

Greenhouse Gas Emissions Goals
(AB32, SB350, EO B-55-18):
✓ 1990 level by 2020
✓ 40% below 1990 levels by 2030
✓ 80% below 1990 levels by 2050
✓ Carbon Neutrality by 2045

Renewable and Clean Electricity Goal
✓ 100% clean energy by 2045 (SB 100)

Transportation 41%
Industrial 24%
Electricity 15%
AG/Forestry 8%
Residential 7%
Commercial 5%

424.1 MMT CO₂eq (2017)

Source: CARB, Greenhouse Gas Emissions Inventory.
California’s Leadership

Greenhouse Gas Emissions Trends in California from 2000 to 2017

Source: CARB, Trends of Emissions and Other Indicators.

- All Sectors
- Transportation
- Electric Power
- Industrial

2020 Limit = 431

Source: CARB, Trends of Emissions and Other Indicators.
California’s Lithium Valley Vision

Clean (Geothermal) Power

Geothermal Lithium

Clean Transportation
The California Energy Commission is the state’s primary energy policy and planning agency with seven core responsibilities:

- Invest in energy innovation
- Advance state energy policy
- Achieve energy efficiency
- Develop renewable energy
- Transform transportation
- Oversee energy infrastructure
- Prepare for energy emergencies
New geothermal projects face technical and financial hurdles.

California Energy Commission provides the largest currently existing source of funding for geothermal energy research in the state.

EPIC provided $7 million to geothermal research.
Project Highlight: Direct Lithium Extraction

- $873,387 of EPIC funds provided to SRI Intl.
- Innovative sorbent for lithium recovery from geothermal brine
- Direct production of lithium carbonate without intermediate lithium chloride
- No acidic waste
- Technology is patented and licensed to ExSorption, Inc.
- Plans to commercialize technology for lithium extraction from geothermal brines.
Upcoming Lithium Recovery R&D

Recent **EPIC grant funding opportunity:**

- **$14 million** to geothermal research and demonstration projects
- **$10 out of $14 million** to projects advancing direct lithium extraction from geothermal brine
- Lithium recovery R&D aligns with the **“Geovision Roadmap”** by the U.S. Department of Energy

*Imperial Valley Geothermal Field. (Source: Land Use Database)*
Thank You!

Dr. Katharina Gerber
Energy Generation Research Office
EPIC Program
Katharina.Gerber@energy.ca.gov
GTO Efforts in Geothermal Energy and Critical Materials

California Lithium Recovery Initiative Symposium
February 12, 2020

Sean Porse, Lead Analyst
Geothermal Technologies Office
GTO GeoVision and Mineral Recovery

KEY ACTION 3.3 – Quantify additional geothermal value streams

Additional geothermal value streams, such as tapping the desalination potential of geothermal energy and recovering dissolved solids from geothermal fluids, can help address the country’s water and critical materials issues and create added revenue opportunities for geothermal operations.

DELIVERABLE(S): Analyses of additional geothermal value streams, including new potential value streams.

IMPACT(S): Increased opportunities to realize additional revenue and value from geothermal technologies.

<table>
<thead>
<tr>
<th>SUB-ACTION(S)</th>
<th>DELIVERABLE(S)</th>
<th>IMPACT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB-ACTION 3.3.2: Analyze potential and develop advanced technologies for</td>
<td>Economically feasible methods and processes to recover minerals from geothermal fluids at the commercial scale.</td>
<td>Ability to economically extract valuable and strategic materials from geothermal fluids. Cost-effective extraction of strategically important resources from geothermal brines.</td>
</tr>
<tr>
<td>cost-effective and commercial-scale mineral recovery.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Phase I GTO Mineral Recovery FOA Awards – 2014

<table>
<thead>
<tr>
<th>Funded Organization</th>
<th>Nine awards</th>
<th>$4 million</th>
<th>Funded Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Research</td>
<td>Geothermal Thermoelectric Generation (GTEG) with Integrated Temperature Driven Membrane Distillation and Novel Manganese Oxide for Lithium Extraction</td>
<td></td>
<td>Tussar Environmentally Friendly Economical Sequestration of Rare Earth Metals from Geothermal Waters</td>
</tr>
<tr>
<td>SRI International</td>
<td>Selective Recovery of Metals from Geothermal Brine</td>
<td></td>
<td>LBNL Engineering Thermophilic Microorganisms to Selectively Extract Strategic Minerals from Low Temperature Geothermal Brines</td>
</tr>
<tr>
<td>University of California, Davis</td>
<td>Maximizing REE Recovery in Geothermal Systems</td>
<td></td>
<td>PNNL Magnetic Partitioning Nanofluid for Rare Earth Extraction from Geothermal Fluids</td>
</tr>
<tr>
<td>Carnegie Mellon University</td>
<td>Chelating Resins for Selective Separation and Recovery of Rare Earth Elements from Low Temperature Geothermal Water</td>
<td></td>
<td>PNNL Evaluation of Advanced Sorbent Structures for Recovery of Rare Earths, Precious Metals and other Critical Materials from Geothermal Waters</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simbol Determination of Rare Earths in Geothermal Brines and Evaluation of Potential Extraction Techniques</td>
</tr>
</tbody>
</table>

- **Metal ion imprinted polymers (SRI International)**
- **Solid-State Sorbent Technology (PNNL)**
<table>
<thead>
<tr>
<th>Funded Organization</th>
<th>Four awards</th>
<th>Four awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Wyoming</td>
<td>Investigating rare earth element concentration in US oil and gas (produced) and geothermal waters</td>
<td>$3.8 million</td>
</tr>
<tr>
<td>EGI/University of Utah</td>
<td>Assessing and characterizing strategic/critical materials in US geothermal and hydrocarbon reservoirs</td>
<td></td>
</tr>
<tr>
<td>Lawrence Livermore National Laboratory</td>
<td>Bioengineering specialized microbes designed to extract rare earth metals from geothermal fluids</td>
<td></td>
</tr>
<tr>
<td>Pacific Northwest National Laboratory</td>
<td>Demonstrating magnetic nanofluid technology for REE extraction from geothermal brines</td>
<td></td>
</tr>
</tbody>
</table>
Lithium Recovery from Geothermal Brines – DOE Retrospective

**Key observations**

- Natural brines are complex – they need to be evaluated in their entirety (simplified synthetic brines can produce misleading results in the lab)

- Multistep process likely needed to extract Li successfully (pretreatment of brines may be needed to remove Fe, SiO$_2$)

- Extraction system needs to be cognizant of reinjection requirements (brine needs to stay hot to avoid scaling)

**Different Approaches**

- Empirical (trial and error) methods for extraction

- Modification of other methods previously used for Li extraction (from salars)

- Chemical modeling (molecular dynamics simulations, coupled process reaction simulations) may help identify & screen possible methods/processes to more efficiently separate Li from brines
EERE seeks to demonstrate added value in regions where geothermal brines can deliver critical elements such as lithium.

Uniting GTO, AMO, and VTO creates clear-path integration from supply to manufacturing to end-market, with improved efficiencies and economics.
Current DOE Efforts – Critical Materials Supply Chain Nexus

**Technology Benchmarking and Techno Economic Analysis (NREL)**
- Reviewing prior GTO-funded, as well as available commercial operators data on mineral recovery performance
- Benchmark technologies – process steps, cost inputs, operational efficiencies
- Incorporate battery storage chemistry requirements into benchmarking considerations

**Supply Chain and Lifecycle Analysis of U.S. Lithium Pathways (CMI)**
- Mapping supply chains, trade flows, and global demand projections of Lithium
- Understand the minimum performance cost requirements

**Battery Critical Materials Supply Chain Workshop (DOE)**
- **Inform DOE cross-cutting R&D strategies** that strengthen battery critical materials supply chains
- Gather data and feedback on relevant performance metrics to support TEA
- Factors in determining success for validation projects
Questions?
The California Lithium Supply Chain Opportunity

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alexjadecove

California’s Lithium Recovery Initiative
Hosted by the California Energy Commission
Wednesday, 12 February, 2020
Stanford University
Lithium Ion Batteries and the Growing Lithium Market
Needed: Lithium Supply to Satisfy EV LIB Demand

“That’s 68 new 25,000 tLCE/year extraction projects by 2030 to meet new demand”
– Rodney Hooper

We will need more lithium chemicals.
We may especially need more LiOH·H₂O compared to Li₂CO₃ for new cathode chemistries.
Needed: Lithium Supply to Satisfy EV LIB Demand

Lithium Hydroxide, Battery Grade
CAS No.: 1310-66-3
Formula: LiOH·H2O
Appearance: White powder
Specifications:

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard (wt.%)</th>
<th>Typical (wt.%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LiOH</td>
<td>56.5</td>
<td>56.5</td>
</tr>
<tr>
<td>CO₂</td>
<td>0.35</td>
<td>0.30</td>
</tr>
<tr>
<td>Na</td>
<td>0.002</td>
<td>0.0015</td>
</tr>
<tr>
<td>K</td>
<td>0.001</td>
<td>0.0005</td>
</tr>
<tr>
<td>Mg</td>
<td>0.001</td>
<td>0.0002</td>
</tr>
<tr>
<td>Ca</td>
<td>0.0015</td>
<td>0.0010</td>
</tr>
<tr>
<td>Al</td>
<td>0.001</td>
<td>0.0002</td>
</tr>
<tr>
<td>Fe</td>
<td>0.0005</td>
<td>0.0003</td>
</tr>
<tr>
<td>Ni</td>
<td>0.001</td>
<td>0.0003</td>
</tr>
<tr>
<td>Cu</td>
<td>0.001</td>
<td>0.0002</td>
</tr>
<tr>
<td>Pb</td>
<td>0.001</td>
<td>0.0002</td>
</tr>
<tr>
<td>SO₃₂⁻</td>
<td>0.010</td>
<td>0.0020</td>
</tr>
<tr>
<td>Cl</td>
<td>0.006</td>
<td>0.0012</td>
</tr>
<tr>
<td>Mn</td>
<td>0.0005</td>
<td>0.0003</td>
</tr>
<tr>
<td>Si</td>
<td>0.003</td>
<td>0.0015</td>
</tr>
<tr>
<td>Zn</td>
<td>0.001</td>
<td>0.0002</td>
</tr>
<tr>
<td>Insoluble in acid</td>
<td>0.010</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Note: This product can be made to agreed upon customer specifications.

We will need higher purity lithium chemicals than have been produced historically.
ASX / TSX ANNOUNCEMENT

22 June 2017

Severe Weather Affects Operations

Orocobre Limited (ORE:ASX, ORL:TSX) (Orocobre or the Company) wishes to provide advice about recent severe weather in the Puna Region of Argentina and Chile and its impact on operations and logistics at the Olaroz Lithium Facility and Borax Argentina.

Severe snowfall at Paso de Jama in Chile, which has now reopened

Milder conditions further east at Olaroz

We will need more reliable forms of lithium production that don’t depend on weather & location to function.
Where Lithium Chemicals for Batteries Come From: Present and Future
## Types of Lithium Resources

<table>
<thead>
<tr>
<th>Pegmatites</th>
<th>Sedimentary Deposits</th>
<th>Brines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spodumene</td>
<td>Hectorite</td>
<td>Salars</td>
</tr>
<tr>
<td>Lepidolite</td>
<td>Montmorillonite</td>
<td>Oilfield/Continental</td>
</tr>
<tr>
<td>Petalite</td>
<td>Jadarite</td>
<td>Geothermal</td>
</tr>
<tr>
<td>Zinnwaldite</td>
<td>Searlesite</td>
<td>Ocean</td>
</tr>
<tr>
<td>Amblygonite</td>
<td>Combinations &amp; Others</td>
<td></td>
</tr>
<tr>
<td>Eucryptite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zabuyelite</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Bradshaw
Today’s Two Main Commercial LiOH • H₂O Supply Chains

- Operating Brine Extraction
- Operating Li₂CO₃ Conversion to LiOH • H₂O
- Operating Mineral Extraction
- Operating Mineral Refining
Tomorrow’s Possible LiOH \cdot H_2O Supply Chains

- Operating Brine Extraction
- Operating Li_2CO_3 Conversion to LiOH \cdot H_2O
- Operating Mineral Extraction
- Operating Mineral Refining
- Selection of Developing Sediment Projects
- Selection of Developing Brine Projects
- Selection of Developing Mineral Projects
- Selection of Developing Mineral Refiners
The California Lithium Supply Chain Opportunity
Californians: The OG Lithium Industry Mavericks & Perennial Do-Good-Go-Getter Smart (and Creative?) People
## Californian Opportunities for Vertical Integration

### Pegmatites

- Spodumene
- Lepidolite
- Patalite
- Zinnwaldite
- Amblygonite
- Eucryptite
- Zabuyelite

### Sedimentary Deposits

- Hectorite
- Montmorillonite
- Jadartite
- Searlesite
- Combinations & Others

### Brines

- Salars
- Oilfield/Continental
- Geothermal
- Ocean

### Project Characteristic

<table>
<thead>
<tr>
<th>Project Characteristic</th>
<th>South American Salar-Type Brines</th>
<th>Australian Spodumene &amp; Chinese Conversion</th>
<th>Geothermal Lithium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Intensity of Heat &amp; Power Consumption</td>
<td>Burn natural gas or diesel</td>
<td>Burn natural gas or coal</td>
<td>Free zero-carbon heat from brine</td>
</tr>
<tr>
<td>Proximity to Battery Manufacturing</td>
<td>No local cathode manufacturing</td>
<td>Interjurisdictional risk</td>
<td>Close proximity to future battery manufacturers</td>
</tr>
<tr>
<td>Waste Management</td>
<td>Evaporate water in desert or reinject brine to dilute resource</td>
<td>Production of tailings</td>
<td>Spent brine reinjected by design</td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>Argentina, Chile, and Bolivia notorious for sovereign risk</td>
<td>Dependence on Chinese converters</td>
<td>USA &amp; Germany pose zero sovereign risk</td>
</tr>
</tbody>
</table>

### The Western Sedimentary Lithium Projects – October 2019

1. McDermitt Project (Jindal Resources)
2. Thacker Pass (Lithium Americas)
3. Clayton Valley Lithium Project (Cypress Development)
4. Rhyolite Ridge (ioneer)
5. Zeus Property (Neram Ventures)
6. Tonopah Lithium Claims (American Lithium)
7. Big Sandy (Hawkstone Mining)
8. U.S. Borax (Rio Tinto)
9. Sonora Lithium Project (Bacanora Minerals)

### Map

- The map highlights the locations of the projects in the Western Sedimentary Lithium Projects.

- The map includes project locations in the USA and Mexico.

- Key project locations are indicated with numbers:
  1. McDermitt Project
  2. Thacker Pass
  3. Clayton Valley Lithium Project
  4. Rhyolite Ridge
  5. Zeus Property
  6. Tonopah Lithium Claims
  7. Big Sandy
  8. U.S. Borax
  9. Sonora Lithium Project

- The map also shows the proximity to future battery manufacturers and the associated risks.
1. Extraction rate and efficiency does not depend on rain or wind speed,
2. The need for complex & expensive evaporation ponds is eliminated and either lithium carbonate or hydroxide can be produced,
3. Up to 90% lithium extraction compared to 40% for evaporation pond systems,
4. Lithium is extracted in hours instead of days,
5. Production of a high concentration and purity lithium concentrate which can be easily processed into battery quality lithium chemical products,
6. The concentration of Mg, Ca, and SO₄ in the brine does not matter,
7. OPEX typically $3-5,000/tLi₂CO₃ much cheaper than Australian spodumene,
8. Minimal footprint required for processing compared to evaporation ponds so salars remain in their undisturbed natural state with no disturbance to animals and plants,
9. Water consumption is reduced by 50x compared to evaporation ponds,
10. Jade Cove is tracking 40 different groups who are developing DLE processes which could be applied to recovering lithium from different types of aqueous solutions including brines, leachates, and battery recycling wastewaters.
## Things for California to Think About

<table>
<thead>
<tr>
<th>Transportation does not have a major CO₂ or cost impact on lithium chemicals</th>
<th>Lithium supply close to the Nevada Gigafactory doesn’t really matter unless cathode materials are made there</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical processing is much more significant and that should be our focus</td>
<td>Tesla is working on this across the Bay but their cathode is still made in Asia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The CEC should do more to help geothermal lithium developers in the Salton Sea</th>
<th>Battery manufacturing is complex and Imperial Valley may not be the best place to do it</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Build connections with potential off-takers &amp; development partners</td>
<td>Might be different reasons why it is a good or bad place to build a cathode/battery manufacturing plant</td>
</tr>
<tr>
<td>• Help facilitate investment from state government or quasi-state government (e.g. CalPERS?)</td>
<td>California is already leading the decarbonization revolution and we should all be proud of that</td>
</tr>
<tr>
<td>• Socialize a better understanding of the size of the lithium resource according to 43-101 guidelines</td>
<td>• Concentrate funds on the best projects that are most likely to succeed</td>
</tr>
<tr>
<td>• We should be proud of producing large quantities of chemicals using renewable energy in the US or Europe</td>
<td></td>
</tr>
</tbody>
</table>
Let’s work together to get projects built in the 2020s!

Alexander Grant
CEO & Principal, Jade Cove Partners
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+1 415-630-3069
www.jadecove.com/research
alexjadecove

California’s Lithium Recovery Initiative
Hosted by the California Energy Commission
Wednesday, 12 February, 2020
Stanford University
ENERGYSOURCE MINERALS - INTRODUCTION

• ES Minerals’ mission is to transform the way lithium is extracted, to be low-cost, low-carbon, safe and efficient.


• Demonstrated to be the key that unlocks Salton Sea lithium development.

• Further, it’s a technology that can be deployed globally, disrupting current industry practices, with a smaller environmental and cost footprint compared to competing lithium separation techniques.
ILiAD: ROBUST TECHNOLOGY FOR ALL BRINE APPLICATIONS

- ILiAD technology can be the heart of any lithium processing flowsheet.
- ILiAD can be deployed on salar brines, geothermal brines, and petro-brine resources; can be coupled to and significantly reduces the size of almost any downstream process; and is scalable allowing deployment in modular phases.

Geothermal Block Flow

Production Wells → Power Generation → Impurity Removal → ILiAD → Softening → Crystallization → Finished Product to Market

Injection Wells
ILiAD: TECHNOLOGY BENCHMARKING

- ILiAD delivers numerous advantages over alternative approaches, such as fixed bed ion exchange (IX), fixed bed adsorption-desorption (AD), metal organic framework, and/or membrane technology:
  - **Lower CapEx** vs fixed bed IX/AD: smaller vessels / single valve / smaller adsorbent inventory with continuous system.
  - **Lower OpEx**: water as the “reagent” vs IX which requires acid (typically HCl), low energy use, low maintenance costs, lower water requirements.
  - **Better performance**: higher temperature stability (geothermal), longer life, and no attrition observed.
  - **Productivity**: ILiAD-based system is capable of extracting >90% of the lithium out of brines, doubling the value/output of any brine resource.
  - **Risk**: All evaporation pond operations have histories of delayed start-ups, cost overruns, long residence and process times, product quality challenges and challenged output expansion attempts. Operational output is beholden to seasonal and climate risks.
INTRODUCING PROJECT ATLiS

• The Project is located in Southern California, USA on the Salton Sea Geothermal Field.

• The nameplate capacity is **19,250 tonnes** per annum of Lithium Hydroxide monohydrate (LiOH).*

• The brine resource has been flowing at commercial quantities for over 7 years (7,000 gpm / 1,574 m³/hr) demonstrating viability. $100M well field in operation since 2012.

• Feasibility Study completed in 2019; shows good economic viability and small environmental footprint.

• Option to produce battery grade lithium carbonate or lithium hydroxide.

• Q1 2021 – forecast start of construction.

• Q1 2023 – forecast start of operations.

* - represents **15% of current Salton Sea brine flows**
PROJECT ATLiS: CONFIRMATION OF BATTERY GRADE PRODUCT

• Concentration and crystallization pilot work conducted by Veolia at their Plainfield, IL test facilities.

• Battery spec lithium carbonate material was produced in early 2019.

• Confirmation of battery spec lithium hydroxide material completed in December 2019 utilizing proposed flow sheet.
ENVIRONMENTAL STEWARDSHIP

• ES Minerals’ process leads in every environmental metric.

• \( \text{CO}_2 \) emissions are the lowest of any lithium resource type.

• Water depletion is lowest.

• Land use is smallest.
COMMUNITY BENEFITS

• Significant creation of direct, maintenance and service support, and tertiary jobs.

• Direct economic activity of approximately $70,000,000/yr.

• Large capital investment provides substantial and sustainable property tax stream.
CHALLENGES

• We anticipate being the first geothermal brine resource to operate at commercial scale, this has presented some unique hurdles, real and perceived.

<table>
<thead>
<tr>
<th>RISK</th>
<th>MITIGANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology (general)</td>
<td>Use commercially proven techniques and or equipment</td>
</tr>
<tr>
<td>Direct Lithium Extraction</td>
<td>Avoid TRL &lt;7; implemented known technology with efficient hardware</td>
</tr>
<tr>
<td>CAPEX and OPEX Exposure</td>
<td>Significant Early Engineering / Pilot Demonstration</td>
</tr>
<tr>
<td>Product Quality</td>
<td>Preferred Partners and Guaranty</td>
</tr>
</tbody>
</table>
THANK YOU
Questions?
15 Minute Break
Panel Discussion: Supply

Panel Moderator: Danny Kennedy, New Energy Nexus

• Derek Benson, EnergySource Minerals
• Richard Cohen, Rio Tinto
• Rod Colwell, Controlled Thermal Resources
• Jonathan Weisgall, Berkshire Hathaway Energy
Panel Discussion: Demand

Panel Moderator: Tyson Eckerle, GO-Biz
- Julie Blunden, EVGo
- Sarah Busch, California Energy Storage Alliance
- David Deak, Marbex LLC
- Stella Li, BYD Motors LLC
Panel Discussion: Execution and Regulation

Panel Moderator: Commissioner Karen Douglas, California Energy Commission

• Tim Kelley, Imperial Valley EDC
• Jim Minnick, Imperial County Planning and Development
• Jim Scrivner, BLM
Thank you!

California’s Lithium Recovery Initiative Symposium