

February 17, 2025

# MAKING HISTORY: THE FIRST COMMERCIAL DLE OPERATIONS IN NORTH AMERICA

**IBAT** 

International **Battery Metals** 





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# If You Take Away One Thing, Let It Be This Slide:

- Direct Lithium Extraction (DLE)
   <u>is</u> the future of Lithium supply.
- To achieve this future, the DLE technology must be scalable (pilots don't count), economical and proven.
- Many are saying they can do it, but only IBAT has demonstrated commercial scale field capabilities and results.
- Proven technology with lower CAPAX and much much much lower OPEX.





• Iris Jancik, CEO



• John Burba, Founder & CTO





#### • John Burba, Founder & CTO

- IBAT was founded in 2018
- Traded on the TSXV as "IBAT"
- Dr. Burba is the scientist behind the FMC/ Rio Tinto plant, the only operational DLE plant in the world.
- IBAT's technology is fully patented.
- Designed, built and operated the first and only Commercial scale plant in North America.





#### • Iris Jancik, CEO

- Joined IBAT 2024
- more than 20 years' global experience in the infrastructure and water industries
- Water Resources, Desalination and Water
   Treatment solutions
- Municipal and Industrial water treatment plants.
- MBA in International Business from Texas
   A&M University and a Bachelor of Science
   in Civil Engineering from Technion-Israel
   Institute of Technology





# Lithium Extraction Methods

IBAT's patented mobile extraction technology is a step-change from traditional processes that are capital intensive and require long lead, multi-year development cycles before deployment

	Hard Rock / Spodumene / Sedimentary	Traditional Brine / Solar Evaporation	Direct Lithium Extraction-type Technologies	Modular Direct Lithium Extraction
Investment Characteristics	<ul><li>Large Capital</li><li>Long Return Cycle</li></ul>	<ul><li>Large Capital</li><li>Long Return Cycle</li></ul>	<ul><li>Long lead times</li><li>Significant engineering required</li></ul>	<ul><li>Stepwise Progressive Investment</li><li>Staged Results</li></ul>
Exploration, Permitting and Resource Development	<ul><li>Large Comprehensive Review and Development</li></ul>	<ul><li>Large Characterizations and Environmental Disposition</li></ul>	<ul><li>Large</li><li>Comprehensive</li><li>Review and</li><li>Development</li></ul>	<ul><li>Phased Exploration, Permitting and Development</li></ul>
System Design Characteristics	<ul><li>Long Lead</li><li>Large Footprint</li><li>Complex Solids Handling</li></ul>	■ Chemical Mega Project	<ul><li>Chemical Mega</li><li>Project</li></ul>	■ Integrated Mobile Units
Construction	<ul><li>Large Mobilization</li><li>Multi-Organizational Coordination</li></ul>	<ul><li>Large Mobilization</li><li>Multi-Organizational Coordination</li></ul>	<ul><li>Large Mobilization</li><li>Multi-Organizational Coordination</li></ul>	<ul><li>Plug and Play</li><li>Mobilization</li><li>Repetitive</li><li>Fabrication</li></ul>
Participants	<ul><li>Ioneer, Frontier Lithium, Lithium Americas</li></ul>	<ul><li>Allkem, Lithium Argentina, Ganfeng</li></ul>	<ul> <li>Livent, E3 Lithium,</li> <li>Anson Resources,</li> <li>Tetra Technologies,</li> <li>Standard Lithium</li> </ul>	IBAT International Battery Metals

# **IBAT Key Timeline Events**



1998:

First commercial production of lithium chloride utilizing Dr. Burba's DLE technology by FMC (now Livent) at Hombre Muerto Feb. 9, 2021:

IBAT raises total proceeds of ~ \$10MM through Sorcia Minerals (a subsidiary of Ensorcia Metals) and other related party investors

Nov. 29, 2021:

Construction of first modular DLE unit for a total cost of \$25MM Feb. 2, 2022:

IBAT receives
patent # 11,229,880
titled "Modular
Extraction
Apparatus" from
United States
Patent Office

Feb. 24, 2023:

IBAT raises total proceeds of ~ \$10MM through a group of investors represented by Encompass Jan 11 2024

IBAT announces signing of Term Sheet with Customer to deploy its first plant and begin commercial operations

1998

2010

2018

2021

2022

2023

2024

2010:

Rheingold
Exploration Corp
incorporated in
2010 under the
laws of British
Colombia and was
renamed
International
Battery Metals in
August 2017

Nov. 7, 2018:

IBAT enters into exclusive licensing agreements for deployment of its technology in Argentina and Chile with subsidiaries of Ensorcia Metals

Feb. 4, 2021:

IBAT and Ensorcia
(along with
Ensorcia's South
American subs)
amend Licensing
agreements
whereby IBAT is
granted a 10%
interest in
South American
projects

Jul. 19, 2022:

IBAT and Galvanic enter into a limited testing agreement where brine is shipped via tanker trucks to site in Lake Charles LA and IBAT unit operated for a 3-month period

Sept. 28, 2022:

SLR Consulting announces results of limited field testing of Galvanic Smackover brine noting ~69% recovery and 95%+ water recycling July 11, 2024:

IBAT commences operations of first MDLE in the world & first commercial DLE in North America



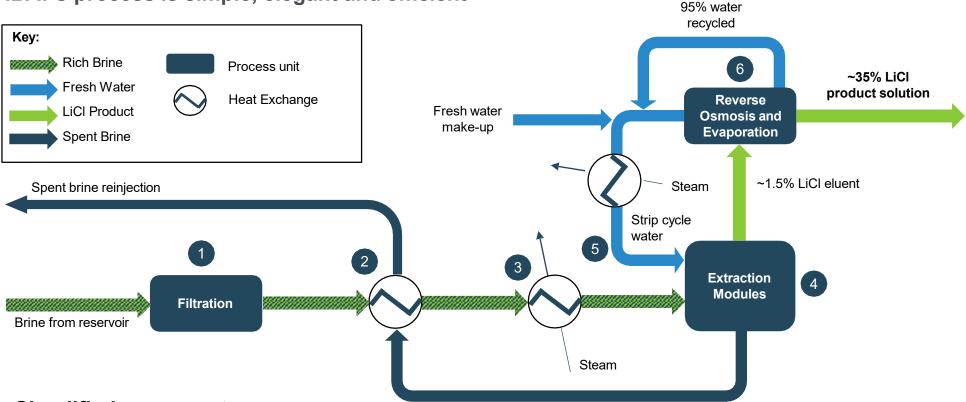
### Heard and Overheard: Fact vs Fiction

- Defining Commerciality
- Pilot vs. Commercial Scale
- Resin/Media/Process Realities
- CAPAX and OPEX clarified



## **Direct Lithium Extraction**

#### IBAT's process is simple, elegant and efficient



#### Simplified process steps:

- Fresh brine from reservoir undergoes filtration to remove suspended solids
- Fresh brine pre-heated through cross exchanger recovering heat contained in spent brine headed for re-injection
- Fresh brine again heated through heat exchanger utilizing process steam to warm brine for maximum extraction efficiency
- Heated brine flows through absorption media until bed saturation is achieved; units extract ~97% of contained lithium<sup>1</sup>
- Stripping cycle starts; heated fresh water elution removes lithium chloride from media
- Product solution concentrated through reverse osmosis and multi-stage evaporation, water from processes recycled to stripping with minimal loss

Process is improvement of technology that has been deployed in South America for decades





#### Overview:

 We operated our patented Modular DLE plant for a commercial partner in the western U.S. this summer for **83 days** with **8,423** cycles of operations. IBAT produced lithium chloride eluent for the partner's production of batterygrade lithium carbonate with **99.9% purity.** 



#### **Modular Design**



- Operational Highlights:
- 12 columns, 3-foot diameter, running at partner site
- No degradation of adsorbent's performance throughout entire run of operations
- Our MDLE plant consistently
   processed complicated brine
   containing varying lithium
   concentrations and varying extreme
   concentrations of impurities



#### **Making History: Small and Mighty Footprint**



- By the numbers... IBAT's MDLE specs:
- Modular, scalable system with initial 3,000 MTPA installed capacity in base plant
- Proprietary proven technology extracts more than 90% of lithium from brine using no chemicals
- Proprietary double-selective absorbent which captures lithium and chloride ions
- Rapid deployment with MDLE:
  - From fabrication to operation takes about 18 months
  - For 2024 operations, it took less than
  - 4 weeks to transport the 36 plant
  - modules on a 1,600-mile trip to the
  - site.
  - Erection of MDLE from cold storage
  - to Commissioning took less than
  - three months.



# **Transportability**

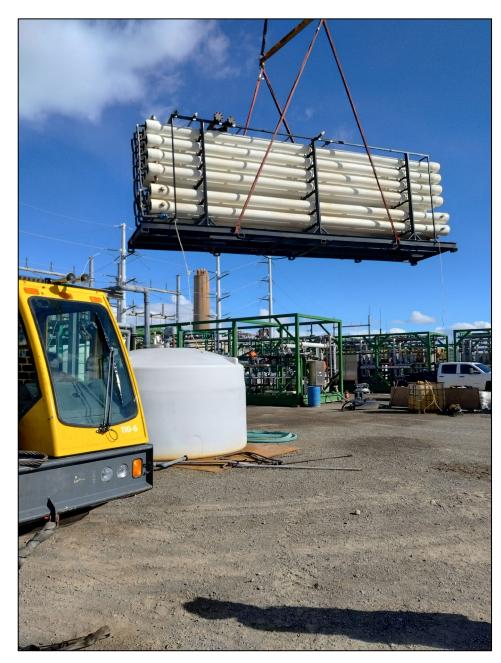






# **Rapid Deployment – Speed to Commissioning**





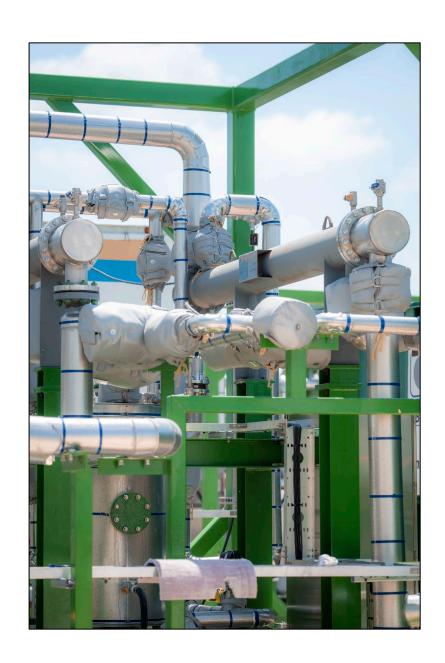


#### **Low CAPEX and OPEX**



- CAPEX about half of stick-built plants.
- CAPEX in phases with resource development.
- OPEX determined by life cycle of Media and utilities.

• Full Automation for on-line adjustments







- Small Footprint Modular and mobile system precludes significant earthworks, land degradation and environmental impact.
- Water usage Minimal makeup water requirement, over 95% recycling of process water.
- No Waste. No Chemicals.
- Low energy requirements mostly for heating brine.
- System includes heat recovery system.



