

Black Mass Recycling

Key to developing a critical minerals strategy

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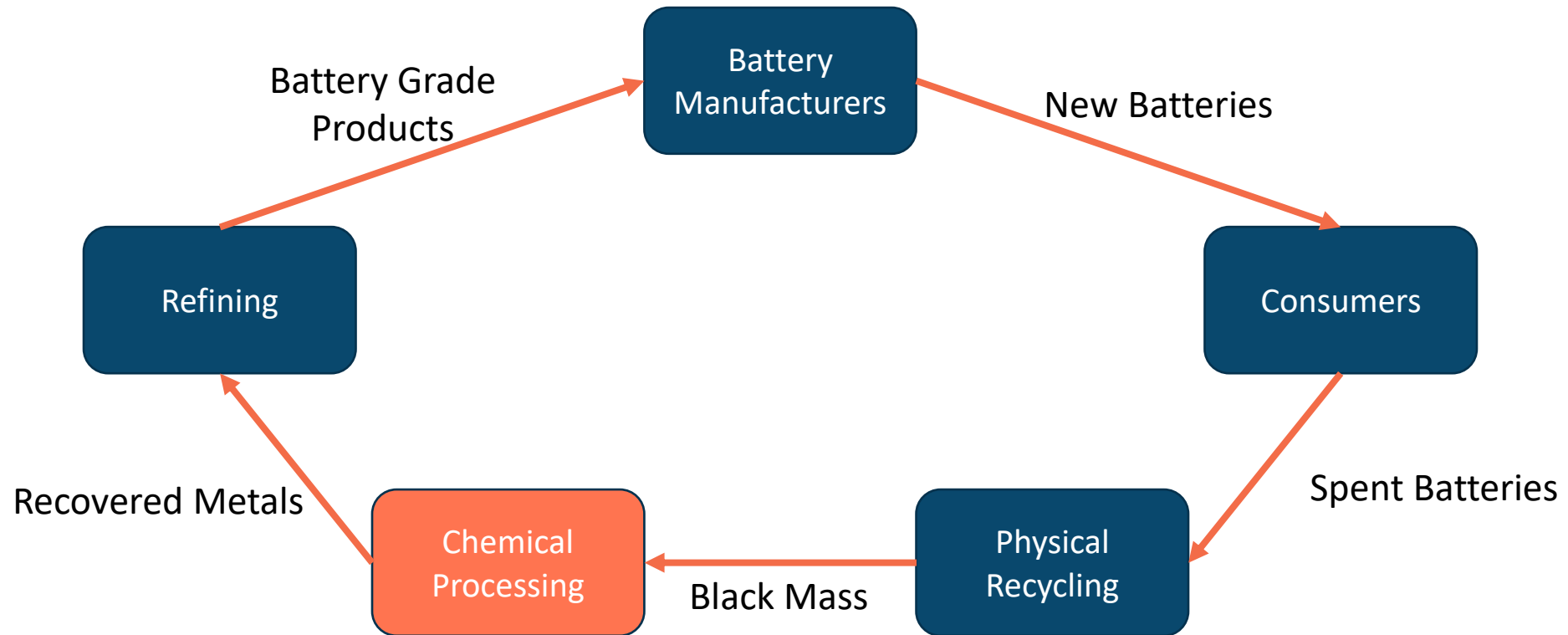
Executing a multiprong strategy in Ontario

- Constructing a cobalt sulfate refinery
- Launched black mass trial
- Leveraging low-carbon footprint and technical expertise
- Plans to expand production
- Signed MOU with Three Fires Group to recycle battery waste



Focused on providing North American supply of battery materials

The process to recycle lithium-ion batteries



Products recovered from Electra's process can be reused

Black mass demonstration plant

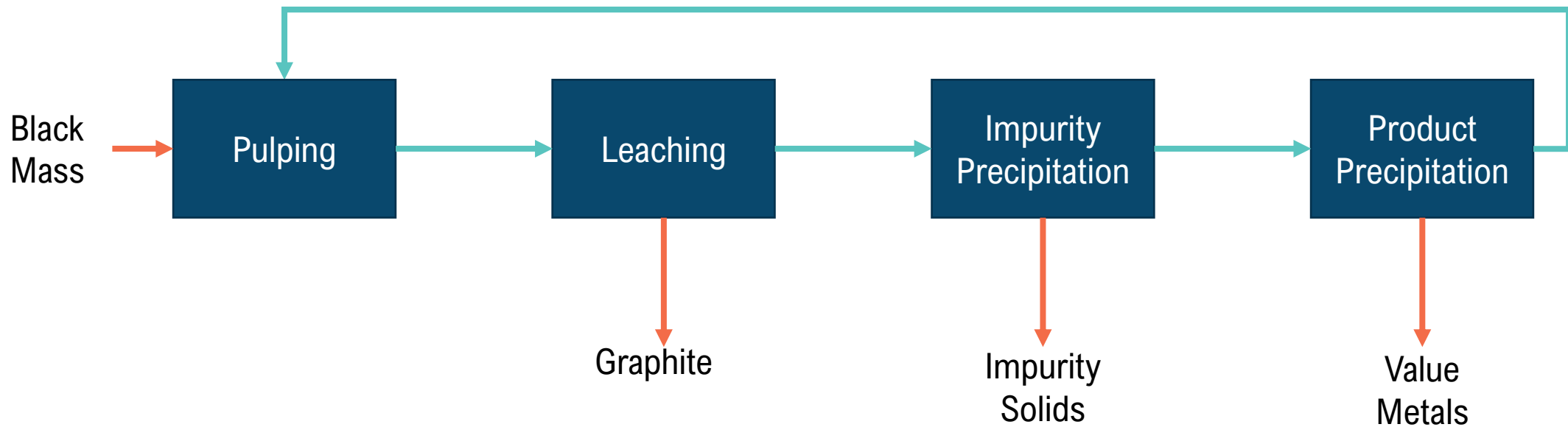
- First plant-scale trial in North America
- Launched in Dec. 2022
- Apply propriety hydrometallurgical process
- Recover high-value elements:
 - > Nickel, cobalt, lithium, manganese & graphite
- Critical success factors for trial
 - > Effectiveness of process
 - > Recovery rates



Electra has achieved a number of industry firsts

Our process

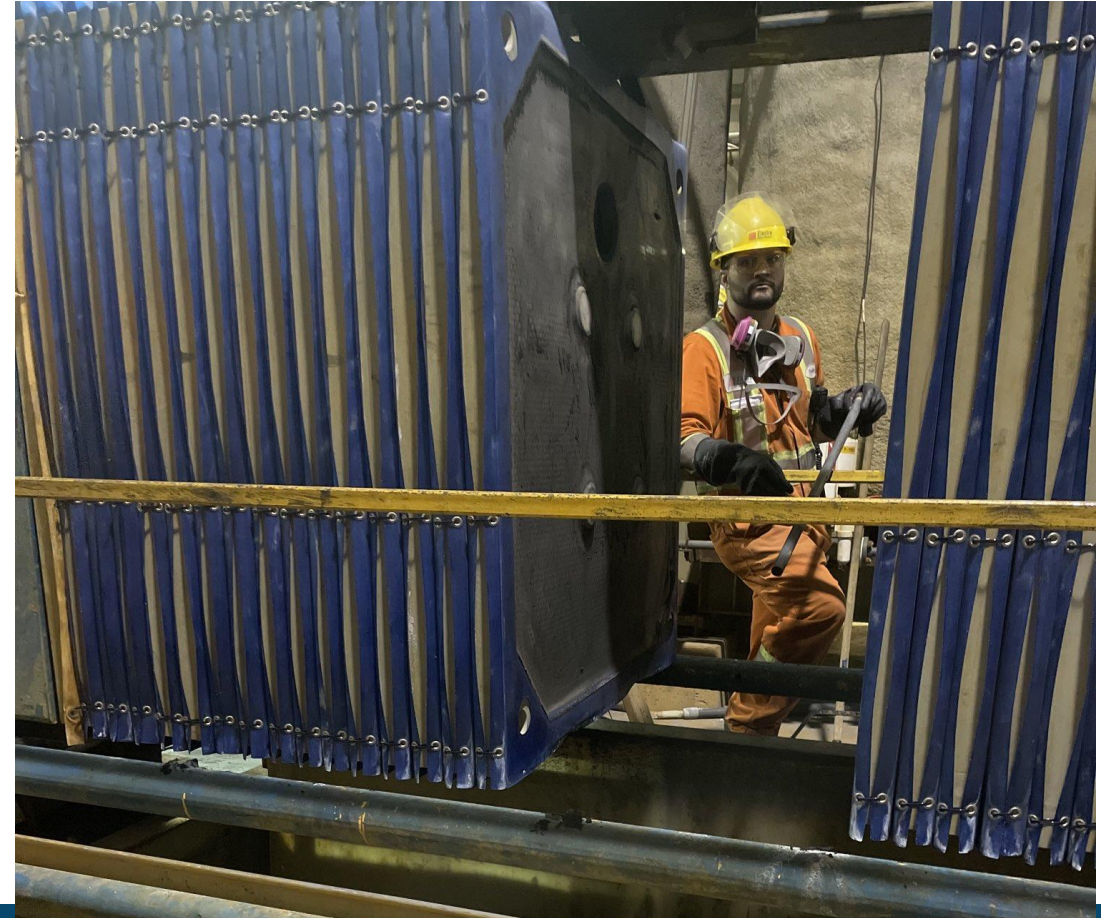
- Black mass is mixed into a slurry with water
- Metals are leached into a solution
- High value elements are recovered



Hydromet process emits less carbon and recovers more high value elements

Our process

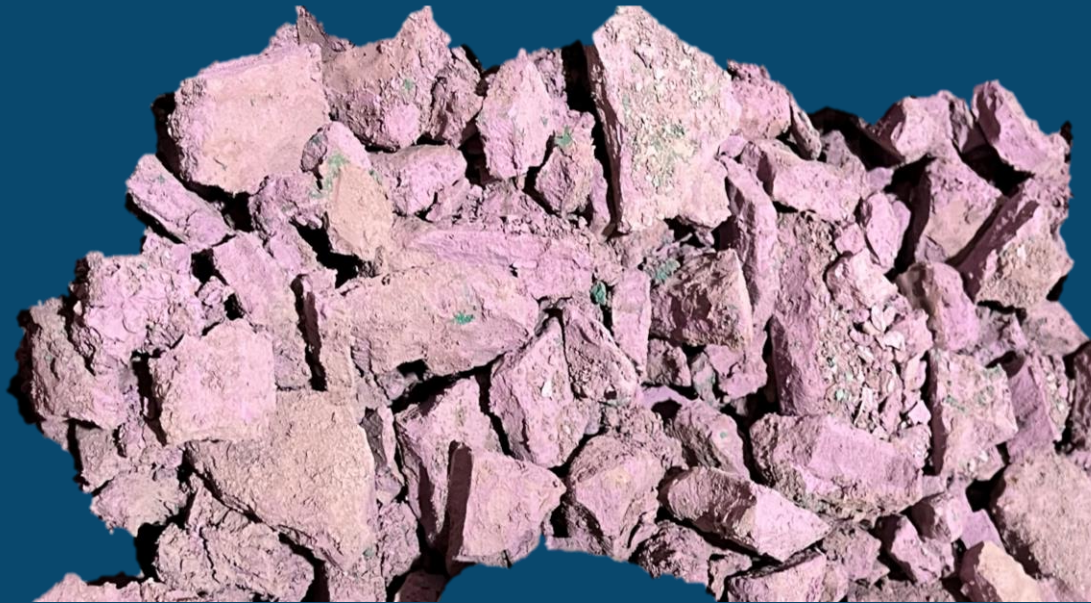
- Precipitated metals are filtered out and collected as solid products
- Water is recycled or treated and returned to the environment
- Renewable energy sources reduce GHG emissions



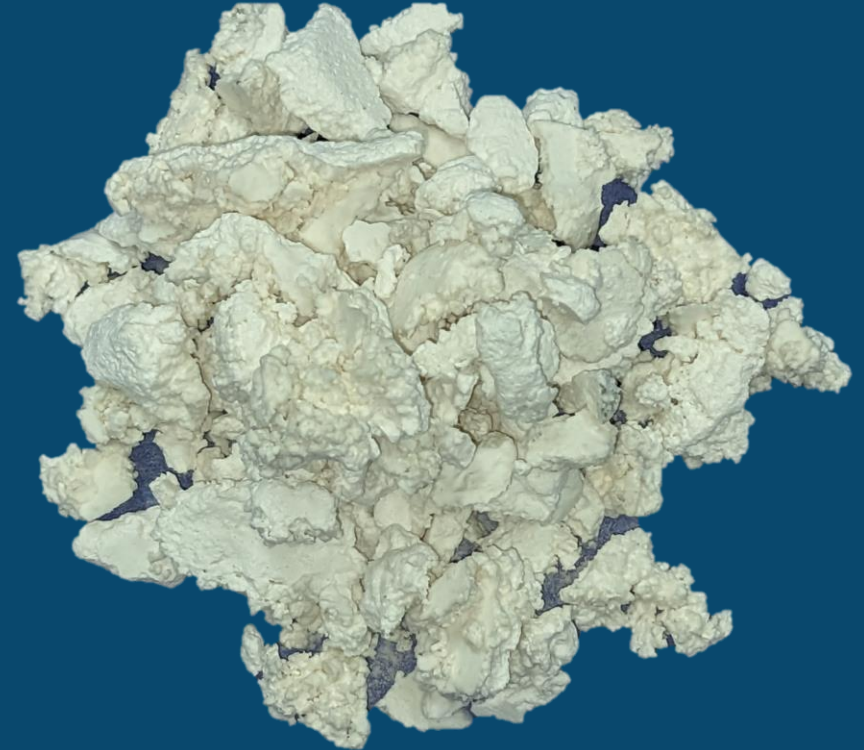
Results from trial have met or exceeded results achieved in lab setting

Recovered products

Nickel-Cobalt MHP



Lithium Carbonate



Recycling addresses demand for critical minerals needed for EV supply chain

Black mass challenges



- Composition can vary as multiple battery types are shredded and blended together
- Black mass contains a wide number of metals and deleterious elements
- Recovered products are not always saleable
- Supply is limited but expected to grow

Electra's plant-scale trial provides opportunity to address challenges

Black mass trial results

- Met or exceeded recoveries achieved in lab setting
- Currently running full circuit
- First recovery of nickel-cobalt MHP product via hydro-met process
- First hydro-met trial in a plant setting
- Produced three target products



Results from trial have met or exceeded results achieved in lab setting

Next steps

- Continued refinement of proprietary process
- Delivery of products to customers
- Exploring potential to process 2,500 tonnes of black mass per annum via continuous operations



Black mass trial results pave the way for potential commercialization



Questions?

Electra Battery Materials

NASDAQ: ELBM

TSX-V: ELBM

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