Li-Cycle®

# Providing a Closed-Loop Solution for Battery Recycling

April 20th 2023

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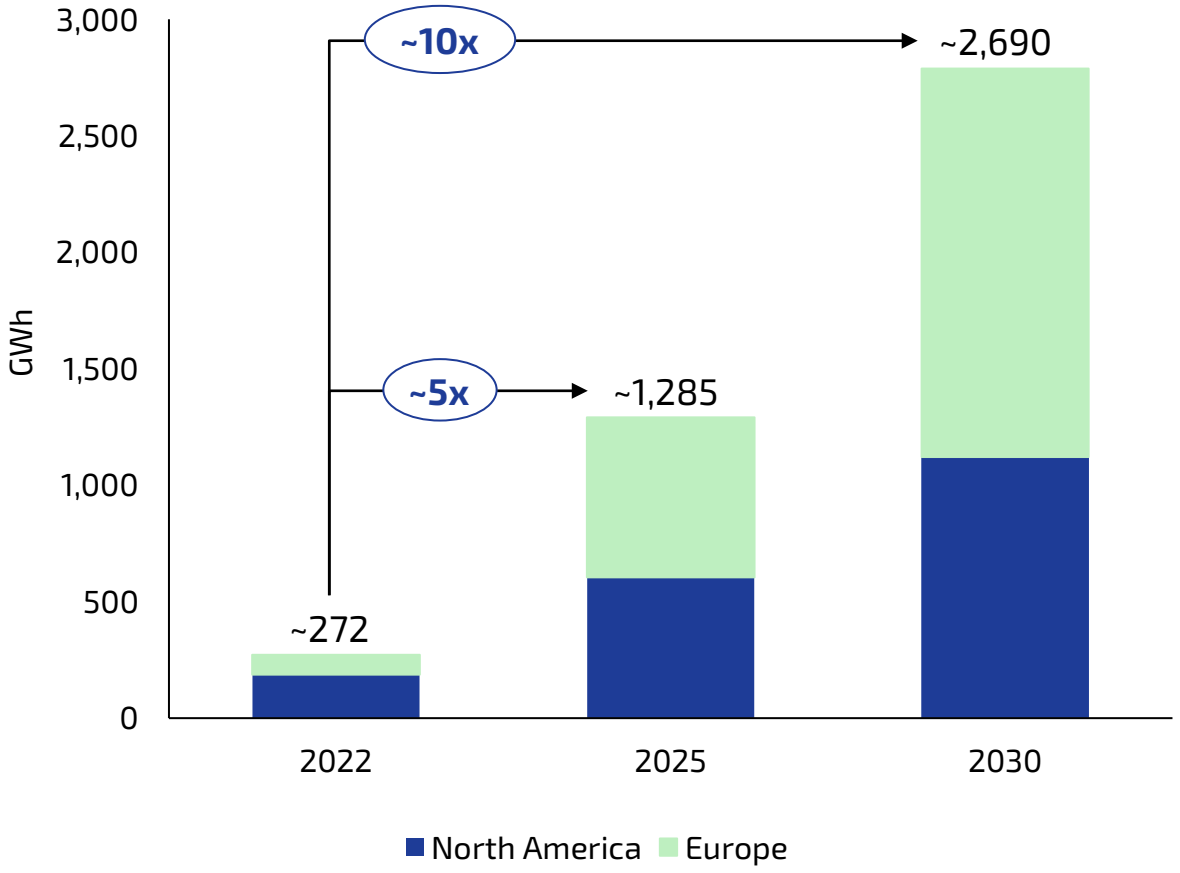
Commercial Director, EMEA

# Agenda

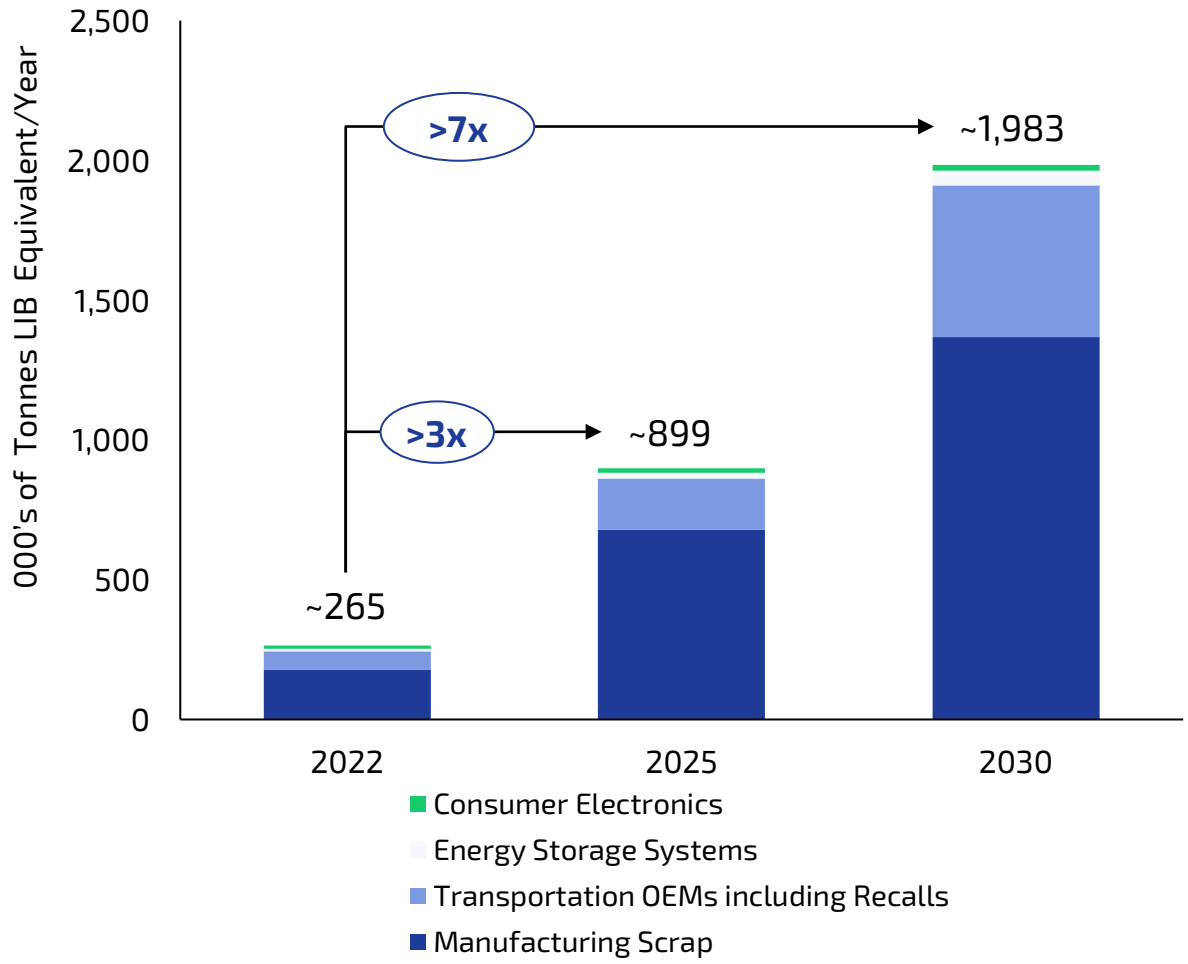
1. Battery Recycling Market Landscape
2. Corporate Profile
3. Technology
4. Spoke & Hub Deployment
5. EMEA Summary
6. ESG

# North America/EU Market Demand Landscape

## North America and Europe Total Announced Megafactory Capacity[(1)]




## North America and Europe Battery Materials TAM[(1)]

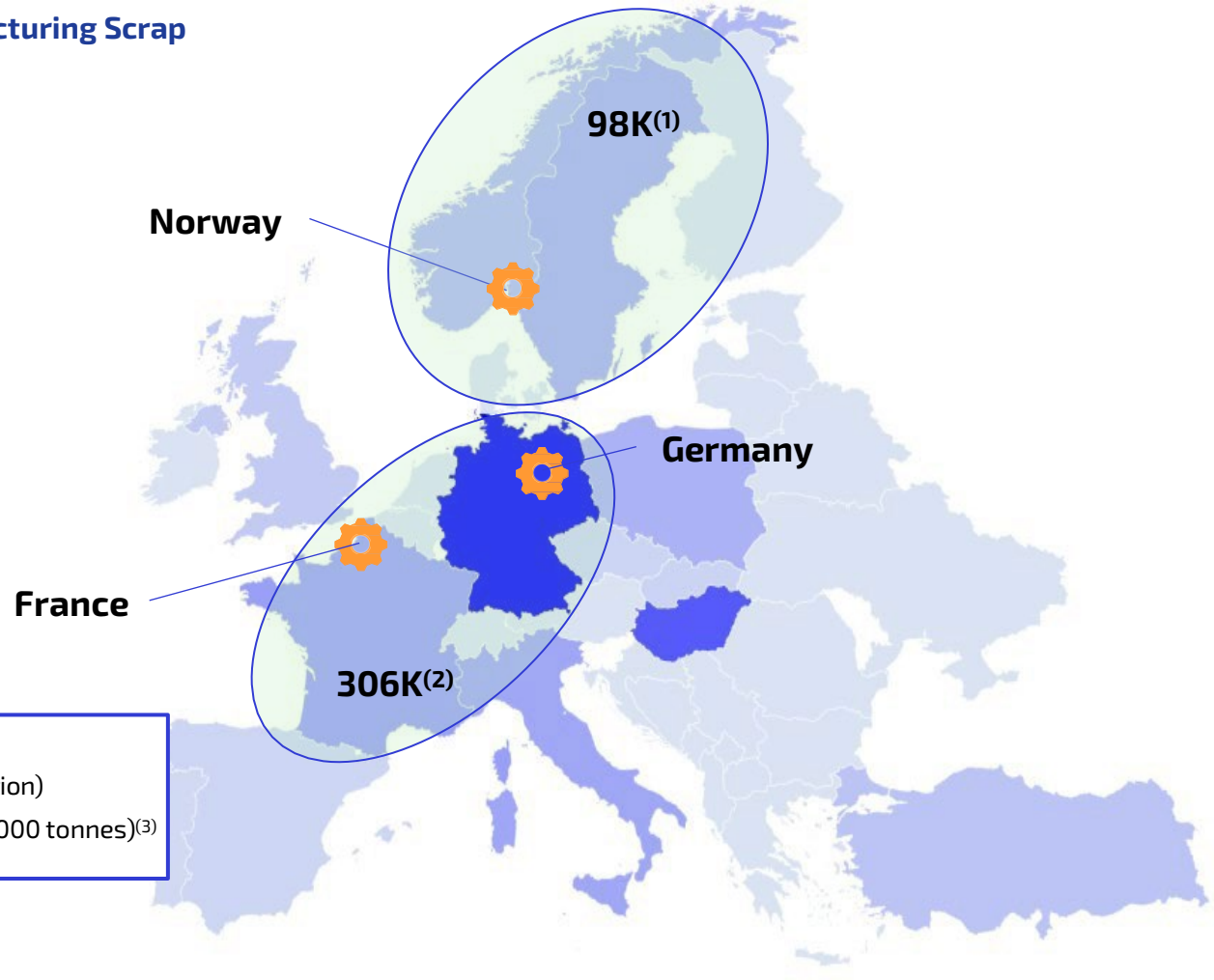



(1) Benchmark Mineral Intelligence (BMI), company sourced announcements and Li-Cycle estimates as of Sept 2022 for Megafactory capacity estimates. TAM refers to Total Addressable Market, with estimates as of March 2023.

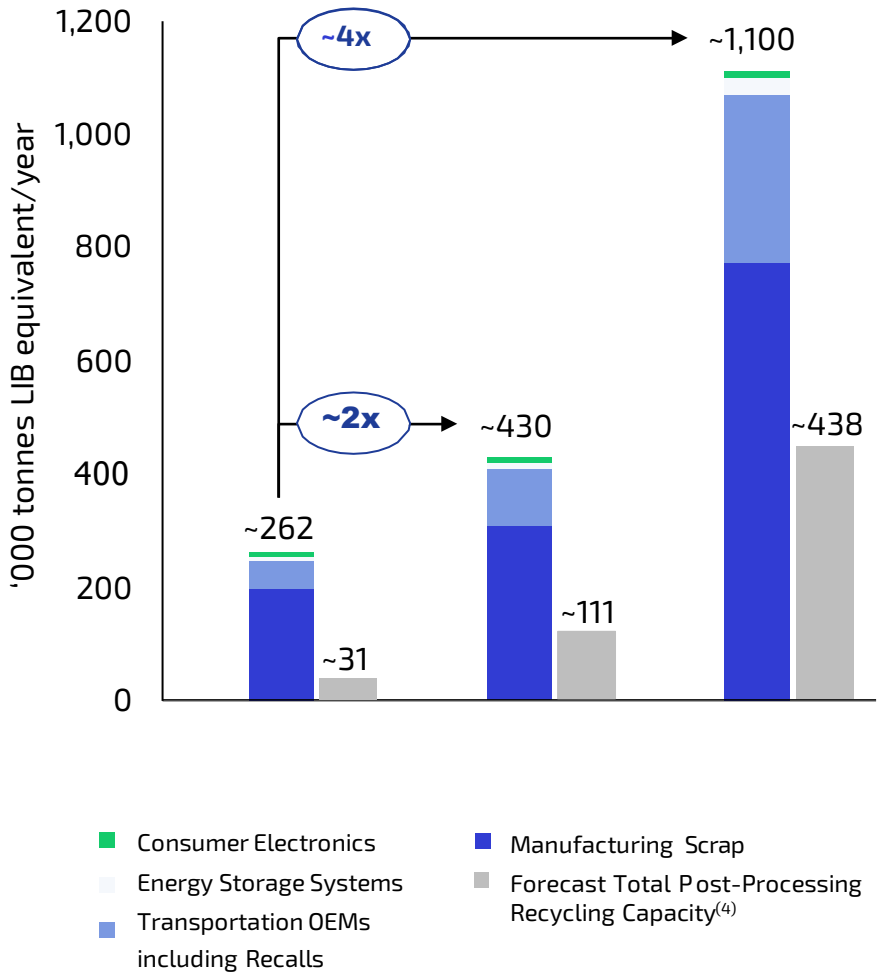
# Europe Battery Materials Market: Accelerating Growth Rates

**2030 LIB Manufacturing Scrap (in '000 tonnes)**

Low — High




## Total Europe Battery Materials TAM



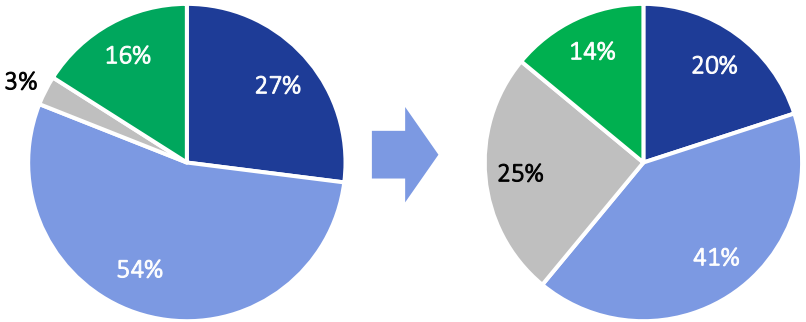

(1) Includes Norway and Sweden
(2) Includes Germany and France
(3) BMI, Li-Cycle estimates and publicly announced nameplate capacities (as of December 2022)
(4) Company announcements and Li-Cycle estimates for post processing recycling capacity

# Expanding Spoke Network Drives Portfolio Growth and Diversifies Feedstock Sources

## Diverse Customer Sources

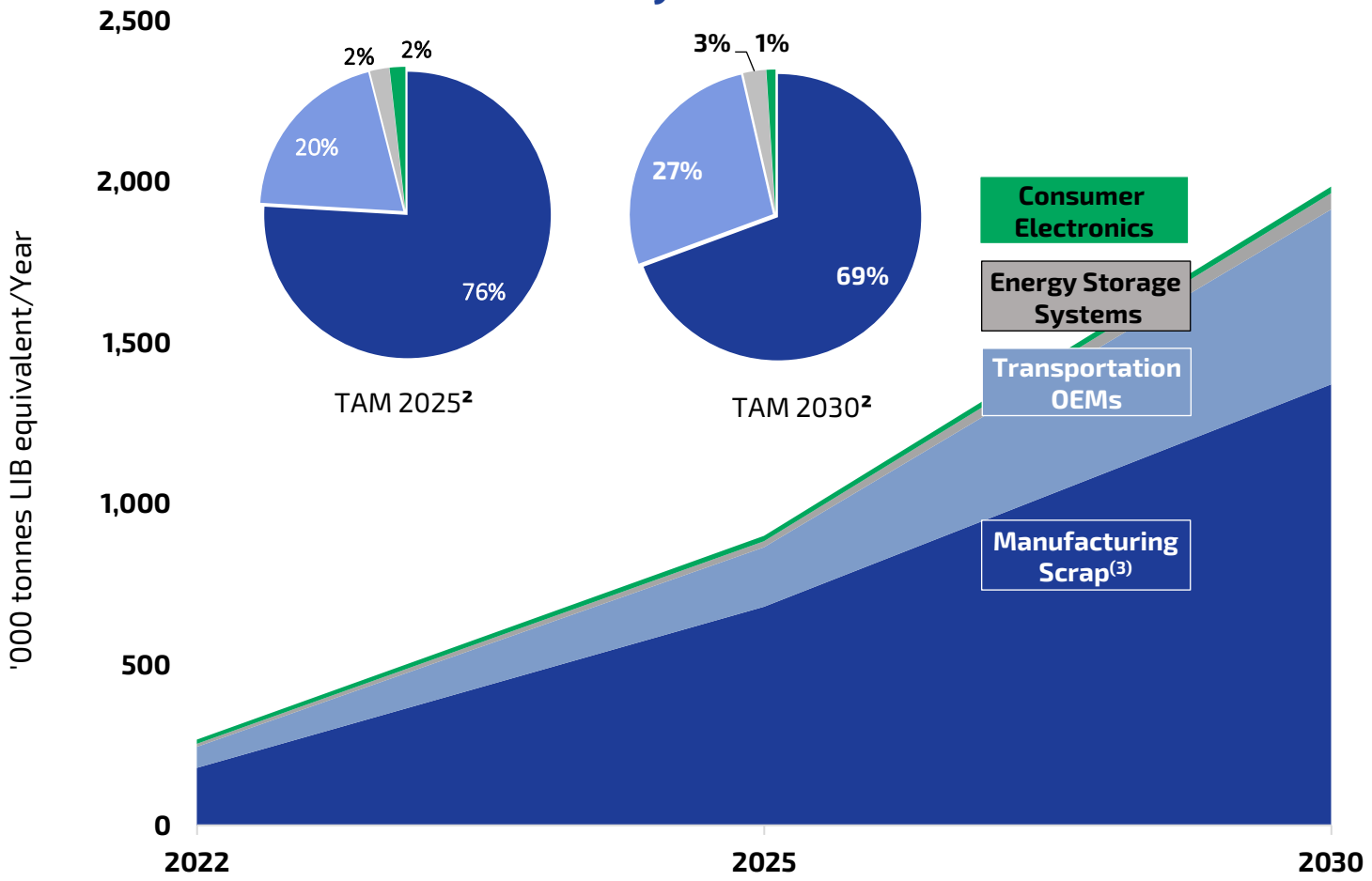
- Battery Manufacturers
- EV OEMs & Service Providers to EV OEMs
- Energy Storage System Owners
- Consumer Electronics Recyclers

## LICY Battery Materials Mix[1]




LICY FY 2021A LICY FY 2022A

## NA and EU Battery Materials TAM[2]




**Manufacturing Scrap** **Transportation OEMs, including Recalls** **Energy Storage Systems** **Consumer Electronics**

(1) Measured by weight of input battery materials
(2) BMI and Li-Cycle estimates for Total Addressable Market (TAM) forecast (as of March 2023). Axis labels based on a conversion ratio of 90,000 tonnes LIB equivalent/year to 35,000 tonnes Black Mass
(3) Manufacturing scrap demand derived from BMI and Li-Cycle estimates

# Li-Cycle At-A-Glance

## Key Facts

**2016** **Founded by Tim Johnston and Ajay Kochhar**

**2021** **Publicly listed in August (NYSE: LICY)**

**~ $580M** **Cash on Hand[1]**

**~ 400+** **Employees Globally**

**$375M** **Conditional commitment loan from U.S. Department of Energy**

## Strategic Objectives

### Health and Safety

**Zero harm goal:** Taking care of our employees, contractors and the community is our license to operate.

### Environmentally Sustainable

**Core to our culture:** Our technology, operations and people support a global decarbonization and greener future.

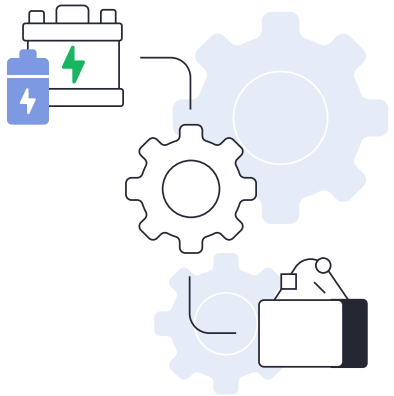
### Profitable Growth

**Accretive returns:** Capture growth at value for our shareowners.

## Spoke & Hub Technologies™

1 Spokes recycle batteries & scrap into black mass

2 Rochester Hub to process into battery-grade lithium, nickel, and cobalt



## Spoke & Hub Capacities

**Spoke current processing capacity:**
**51,000 tonnes** of lithium-ion battery material/year

Expected to increase by year-end 2023 to: **81,000 tonnes** of lithium-ion battery material/year

**Rochester Hub expected processing capacity:**
**35,000 tonnes** of black mass/year, equivalent to 90,000 tonnes of battery material

(1) $578 million cash on hand at October 31, 2022
(2) Spokes expected to have total (existing and future planned) LIB processing capacity of 96,000 tonnes/year; Rochester Hub expected to have 35,000 tonnes of black mass processing capacity/year or 90,000 tonnes LIB equivalent/year or 18 GWh and commence commissioning in late calendar 2023

# Vision, Mission & Values

## VISION

Leading the global supply of recycled critical materials for a clean energy future.

## MISSION

Recycle critical materials to create a sustainable closed-loop battery supply chain.

## VALUES

### Safety

Safety is non-negotiable and our top priority.

### Sustainability

Sustainability is at the core of our business. We are committed to advancing our clean technologies.

### Integrity

We operate honestly, embrace diversity, and respect our employees and stakeholders.

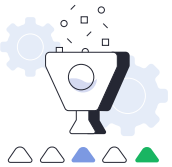
### Agility

We drive innovation and effectively respond to opportunities and challenges to deliver winning results.

# Li-Cycle Benefits

## Closed Loop Solution

Li-Cycle's innovative Spoke & Hub Technologies™ help build a **safe and sustainable battery supply chain** without any significant modification needed by the industry



## Spoke & Hub Technology™

Li-Cycle's 2-step process **with 95% recovery rate** from lithium-ion batteries of all chemistries and form factors. In addition, Arizona and Alabama Spokes have the **capability to shred full battery packs without disassembly**.

Li-Cycle uses the **modular design for its Spokes** which enables rapid capacity growth to meet market demand.

## Environmentally Sustainable

Environmentally-friendly alternative with **smaller environmental footprint** than thermal processes and up to **67% less $CO_2$ emissions than mining and refining.**

## Global Reach

Li-Cycle is currently **executing on its plans to expand into Europe, with continued strong commercial connectivity to Asia (with opportunistic expansion in Asia, where applicable)**.

## Customer-Centric Service Model

Li-Cycle's Spoke & Hub network ensures our processing facilities are **strategically located in close-proximity to our customers**. End-to-end services customized to meet our customers' unique needs.

# Canadian Prime Minister Justin Trudeau and European Commission President Ursula von der Leyen visit Li-Cycle


- On March 7, 2023, Li-Cycle hosted the Prime Minister of Canada, Justin Trudeau, and the President of the European Commission, Ursula von der Leyen, at our Ontario Spoke, and met our co-founders and employees.
- The leaders discussed the importance of Li-Cycle's innovative, proprietary, and sustainable Spoke & Hub Technologies™, and our expansion plans in Canada and Europe

**Justin Trudeau**
@JustinTrudeau
Officiel du gouvernement - Canada

Stopped in at @Li_Cycle with @vonderLeyen. They're recycling lithium-ion batteries for clean tech like electric vehicles, creating jobs, and building up Canada's critical minerals supply chain – and they're opening plants in Europe, too, so they can do the same thing there.

**Ursula von der Leyen**
@vonderleyen
EU official

Inspiring visit of @li_cycle, where lithium batteries are recycled.

Recycling will be a key pillar of our Critical Raw Materials (CRM) Act.

And our CRM Partnership with Canada will strengthen our strategic value chains and help us reach our climate objectives.

# Technology

# LI-CYCLE'S SPOKE & HUB TECHNOLOGY

Raw Material Mining / Production and Refining

Precursor Manufacturing

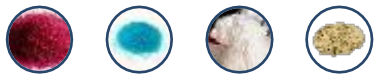
Active Battery Materials Production

Battery Cell and System Production

End-Product Manufacturer

Distributor or Dealer

End Customer



Co Ni Li Mn

Cu Al C Fe Na

**Centralized Hub**

*Hydrometallurgical*

Black Mass

**Regional Spokes**

*Mechanical*

Shredded Cu/Al

Mixed Plastics

Sold into the market

# Li-Cycle Services – Holistic Battery Recycling

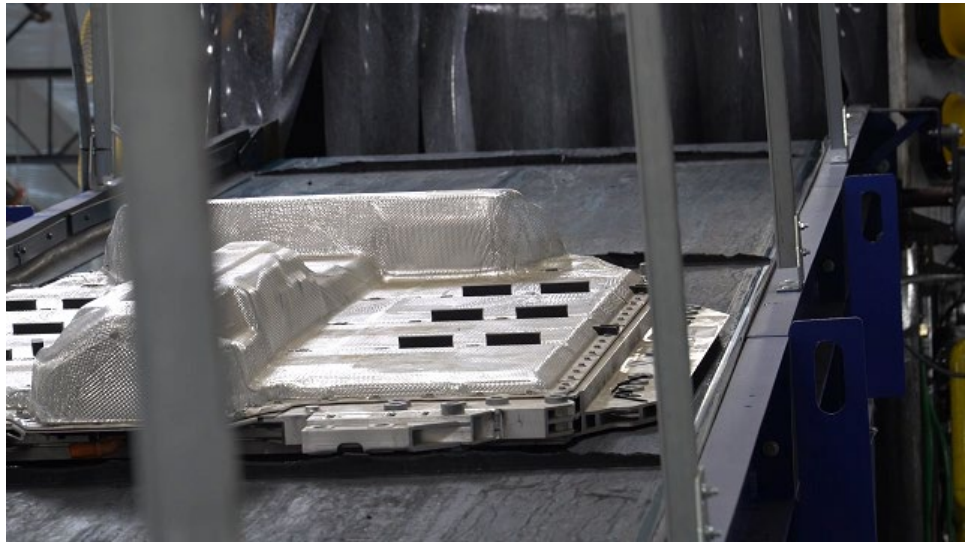
- End-of-Life Batteries
- Recalled Batteries
- Battery Packs
- Battery Modules
- Cells

## Li-Cycle Powder-to-Pack Solution

- Cathode Powder
- Cathode/Anode Foils
- Pressing Scrap
- Electrode Cut-offs
- Cell Assemblies (stacking/folding/winding)
- Electrolyte Filling and Formation Rejects

# Full Pack Shredding Capabilities – Key Differentiator

- Li-Cycle's "Generation 3" Spokes can process full EV and energy storage battery packs without any manual dismantling and discharging
- "Generation 3" Spokes include
  - Arizona Spoke
  - Alabama Spoke
  - Germany Spoke
  - Norway Spoke
  - France Spoke
- Several advantages
  - Enhanced safety and increased cost-effectiveness
  - Witness destruction of R&D prototype packs
  - Cell-To-Pack shredding (pack is effectively a large module)
- Maintain the option to either dismantle packs into modules or shred entire packs



# SPOKE & HUB

# Spoke & Hub Network

## North American Spokes

### Ontario Spoke

- Kingston, ON, Canada
- **5,000 tonnes/year processing capacity**
- Li-Cycle's first Spoke, and successful Hub pilot project
- Operational since Q3 2020
- Initial site work for new and larger Ontario Spoke in Kingston expected to start in 2023

### New York Spoke

- Rochester, NY, USA
- 5,000 tonnes/year main line processing capacity
- 13,000 tonnes input/year ancillary processing capacity
- **18,000 tonnes input/year total processing capacity**
- Operational since Q1 2021

### Arizona Spoke

- Gilbert, AZ, USA
- **18,000 tonnes/year processing capacity (main line and ancillary)**
- Utilizes proprietary full EV pack processing technology
- Operational since Q2 2022

### Alabama Spoke

- Tuscaloosa, AL, USA
- **10,000 tonnes/year processing capacity**
- Utilizes proprietary full EV pack processing technology
- Operational since Q4 2022

## European Spokes

### Germany Spoke

- Near Magdeburg, Germany
- **30,000 tonnes/year processing capacity (main line and ancillary**
- Two main lines to meet growing customer demand
- Utilizes proprietary full EV pack processing technology
- Expected to be operational in 2H 2023

### France Spoke

- Harnes, France
- **10,000 tonnes/year initial processing capacity**
- Utilizes proprietary full EV pack processing technology
- Currently in development, targeted to be operational in 2024

### Norway Spoke

- Moss, Norway
- **10,000 tonnes/year processing capacity**
- Currently in development, initially as a consolidation facility, and then to an operational Spoke in 2024

### Rochester Hub

- Rochester, NY, USA
- Expected to be first-of-its-kind commercial hydrometallurgical battery resource recovery facility in North America
- **35,000 tonnes processing capacity of black mass/year**
- Commissioning expected to start in late 2023

# Flagship Hub Facility in Rochester, NY

## Key Highlights

- The Rochester Hub is expected to be the **first-of-its- kind commercial hydrometallurgical battery resource recovery facility** in North America
- Expected production capacity of battery-grade materials to be recovered and reintroduced into the supply chain:
  - **Lithium Carbonate: 7,500-8,500 tonnes/year**
  - **Nickel Sulphate: 42,000-48,000 tonnes/year**
  - **Cobalt Sulphate: 6,500-7,500 tonnes/year**
- **Processing capacity of up to 35,000 tonnes of black mass/year equivalent to approximately 90,000 tonnes of lithium-ion batteries of 18 gigawatt hours**
- **$375M** conditional commitment loan from U.S. Department of Energy
- Expected to begin commissioning in late 2023

# EMEA Summary

# EMEA Commercial Leadership Team

Elewout Depicker
VP, Commercial & Corporate Development

Manfred Schmidt
VP, Commercial - Battery Supply

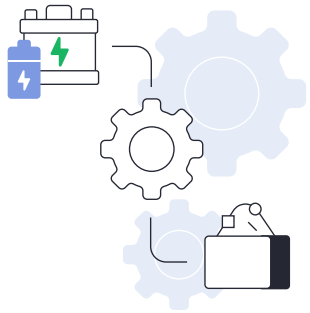
Tom Wadsworth
Commercial Director - Battery Supply

Jonas Jeschke
Commercial Manager – DACH Region

Joacim Adlerborn
Commercial Manager – Scandinavia

Alessandro Tripoli
Commercial Manager – France

# Li-Cycle Europe Spoke Network



**EU Projected Spoke Capacity**

- German Spoke to add **30,000 LIB t/a** capacity by end of **2023**
- Norway, France, other Spokes under development expected to add **50,000 LIB t/a**
- Total pre-processing capacity **80,000 LIB t/a** by **2025**

| EMEA Assets | SOP | Status | Capacity (2025) |
|---|---|---|---|
| Germany Spoke | 2023 | Under construction | 30,000 t/a LIB |
| Norway Spoke | 2024 | Under construction | 10,000 t/a LIB |
| France Spoke | 2024 | Site permit pending | 25,000 t/a LIB |
| Other EU Spoke(s) | TBC | N/A | TBC |

# New KION Partnership

KION GROUP

One of the world's leading providers of industrial trucks, such as forklift trucks and warehouse trucks

- Li-Cycle named preferred global supplier
- Li-Cycle to recycle lithium-ion batteries for KION's global brands
- Commercial contract through 2030
- Recycling begins primarily at the Germany Spoke, expanding to France and other sites


*"With this strategic partnership, we are taking an important step towards the circular economy that we want to implement for our products,"*

Henry Puhl, Chief Technology Officer of KION

# ESG

# Li-Cycle's Global Strategy

**Circular Economy:** Recovering strategic and critical materials from lithium-ion batteries in a safe, environmentally friendly and economically sustainable manner

**Critical Source:** Developing 'urban mining,' a sustainable alternative to current global mining practices, serving as a secondary source solution, based on patented Spoke & Hub Technologies™

**Premier Partner:** Offering go-to solutions to address manufacturing scrap and end-of-life recycling needs for battery and vehicle OEMs

**Strategic Locations:** Deploying an integrated network at regionally optimized locations that reduces costs and safety risks

**Sustainable Technology:** Diverting lithium-ion battery materials from landfill sites and employing non-emitting hydrometallurgical solutions versus traditional pyro processing methods

**Strategic Growth:** Focusing near-to mid-term assets in North America and Europe; growing through commercial partnerships with leading global customers

# Significantly Improved Emissions Profile Compared to Mining

*Compared with traditional mining and refining, **Li-Cycle's Spoke & Hub Technologies™** can (per tonne of battery input):*

**Reduce CO2 emissions by up to**

**40 – 67%**

~38k - 117k tonnes of CO2

**Reduce NOX emissions by up to**

**86 – 89%**

~353k - 495k tonnes of NO2

**Reduce SOX emissions by up to**

**80 – 86%**

~ 226k - 330k tonnes of SO2

**Reduce water usage by up to**

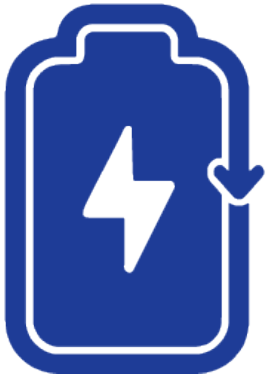
**97%**

~ 2 million cubic metres of water

(1) Based on independent Life Cycle Assessments (LCA) completed on behalf of Li-Cycle. Environmental benefits are shown as emission offsets comparison for 1 tonne of Battery Input. Mining & Refining baseline calculated by a third party, including external sources (GREET, Argonne National Laboratory).
(2) Li-Cycle's LifeCycle Assessment Results are fully loaded, i.e., inclusive of indirect costs not directly associated with the Spoke & Hub process, including transportation of material.
(3) Li-Cycle's process offsets 40-67% of the CO2 Profile of an EV Battery. The battery pack typically accounts for over ~40-50% of an electric vehicle's total CO2 emissions profile (Source: Volkswagen AG).

# EU Battery REGULATION

| Key Targets (by end of year>>) | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) Recycling Efficiency<br>*Obligation on the first recycler to report to relevant national authorities* | 50% | - | 75% lead-acid<br>65% Li | - | - | - | - | 80% lead-acid<br>70% li-based | | | - |
| 2) Recovery Rate of Metals<br>***Obligation on the first recycler to report to relevant national authorities*** | N/A | - | - | - | Li 50%<br>Ni, Co, Cu - 90% | - | - | | Li 80%<br>Co, Ni, Cu - 95% | | - |
| 3) Recycled Content in batteries<br>***Cut-off dates calculated assuming Battery Regulation enters into force by Mat 2023*** | N/A | - | - | - | - | Info on recycled content | - | Li 6%<br>Ni 6%<br>Co 16%<br>Pb 85% | | | Li 12%<br>Ni 15%<br>Co 26%<br>Pb 85% |
| 4) Carbon Footprint<br>***Cut-off dates calculated assuming Battery Regulation enters into force by Mat 2023*** | - | - | Declaration for EV batteries | - | Max threshold for EVs | - | - | - | - | | - |
| 5) Collection Targets | 45% of portable batteries | - | - | - | **63% of portable batteries** | **51% of LMT** | - | **73% of portable batteries** | **61% of LMT** | | - |



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