Emerging technology solutions for real world challenges

Member Update Presentation

What is Blockchain?

Blockchain is a distributed ledger that maintains a continuously-growing list of records called blocks secured from tampering and revision without the need for a central authority.

- Digitization leads to less admin work and consistent data tracking
- Immediate data access for permissioned parties
- Global and scalable to support worldwide partnerships and communication
- Secure and irrefutable

Security   Scalability   Immutability   Speed
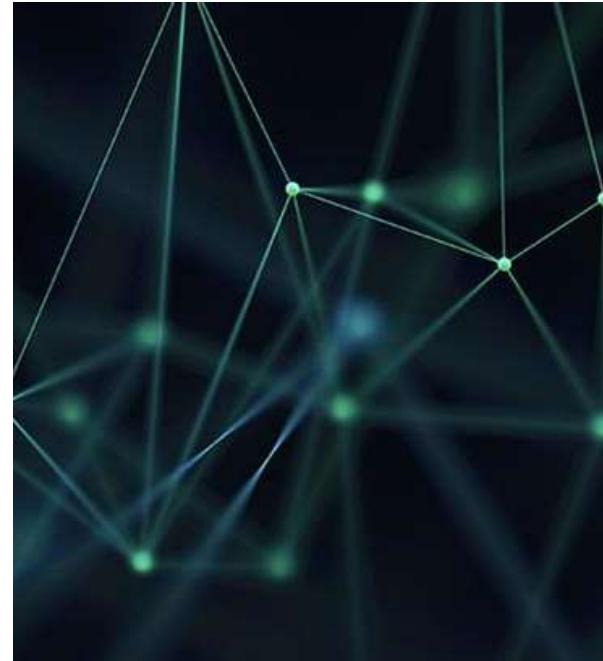
EVERLEDGER

ABOUT EVERLEDGER

Founded in 2015, Everledger is an independent **emerging technology** enterprise focused on addressing real-world challenges through breakthrough solutions to deliver positive social, economic and environmental impact.

We began with the diamond sector using digital ID and blockchain to identify and track sustainable diamonds from mine to market. **For assets that are not uniquely identifiable we couple blockchain technology with auto-ID and advanced material science to connect the asset to the blockchain.**

Unique to Everledger is our deep industry experience in the sectors we support that provides the dimension and passion to deliver successful solutions.

Company Facts:
- HQ in UK, 5 major offices globally in the **US, UK, Israel, India** and **Australia** w/**75 employees**

Awards:
2018: Advance Global Australian Awards - Technology & Innovation (Founder & CEO Leanne Kemp) **/** Barclays Entrepreneur Awards (Founder & CEO Leanne Kemp) / WEF Tech Pioneer - World Economic Forum Tech Pioneer / IBM Champion (Founder & CEO Leanne Kemp) / Women in IT Awards - Innovator of the Year London (Leanne Kemp)
2017: NTT Data Global Open Innovation Business Contest 5.0 - Winner (London)
2016: Digital Top 50 Awards Presented by Google, Rocket Internet & McKinsey / London Innovators Penrose Award - Innovator of the Year / Asia Insurance Technology Awards (Hosted by Celent) - Best Newcomer

Industries & Markets

Diamonds & Gems	Luxury Goods	Fine Art	Fine Wines & Spirits

| Insurance | Critical Materials (e.g. Batteries) | Sustainable Materials & Ethical Chains | |

Partners & Clients

HYPERLEDGER • BARCLAYS • IBM
THOMSON REUTERS • SAP Ariba • BRINKS
applieddnasciences • SAP • ORACLE
GIA • aws • r3 • Silicon craft
AVERY DENNISON

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How can we track EVBs throughout the lifecycle?

1. **Create** a **unique IDs** for parts and packs

2. **Connect** these **IDs** to the internet (Internet of Things)

3. Convenient **user interface** for interaction among battery lifecycle stakeholders

4. **Smart contracts** layout rules for stakeholder roles and interactions. They facilitate, verify and enforce the performance of an agreement and/or transaction

   a. If I am a service facility performing maintenance or repair on a battery, I may be required to upload the maintenance record and scan new parts identification onto the platform

5. As the battery is maintained, salvaged, shipped, repurposed, disassembled and/or sent for recycling, all stakeholders and activities are transparently validated and permanently recorded

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Battery Traceability @ Cell Manufacturer

A jellyroll battery design places two electrode foils into an electrolyte solution.

The cathode and electrolyte solution contain the equivalent of 1 gram of lithium.

18-650 Lithium ion battery
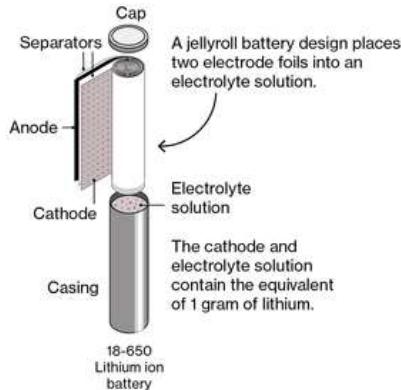
Active materials in a typical Lithium Nickel Cobalt Aluminum Oxide battery

Cathode
- Aluminum 2%
- Nickel 73%
- Cobalt 14%
- Lithium 11%

Anode
- Graphite (carbon) 100%

OPTEL Loading

Cell Lot ID :

Cathode Description

Nickel Lot ID :
Cobalt Lot ID :
Lithium Lot ID :

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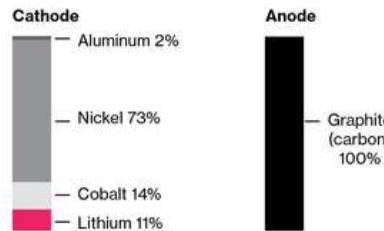
Battery Traceability @ Module Manufacturer

18-650 Lithium ion battery

Module of 444 batteries

Module Manufacturer

Module ID :

Battery Lot ID

Lot #1 :
Lot #2 :
Lot #3 :
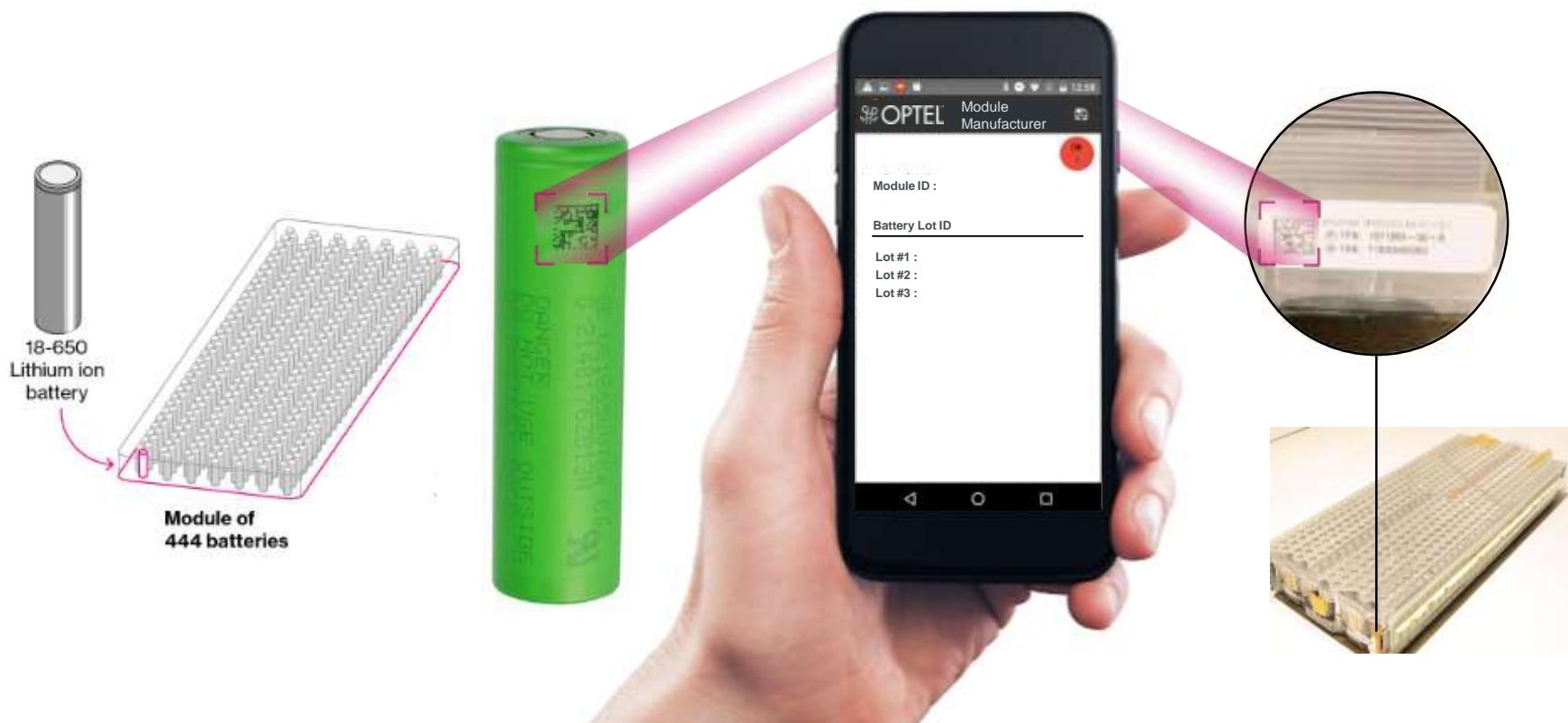
Battery Traceability @ Pack Manufacturer

Pack ID :

Modules ID

Module #1 :
Module #2 :
Module #3 :

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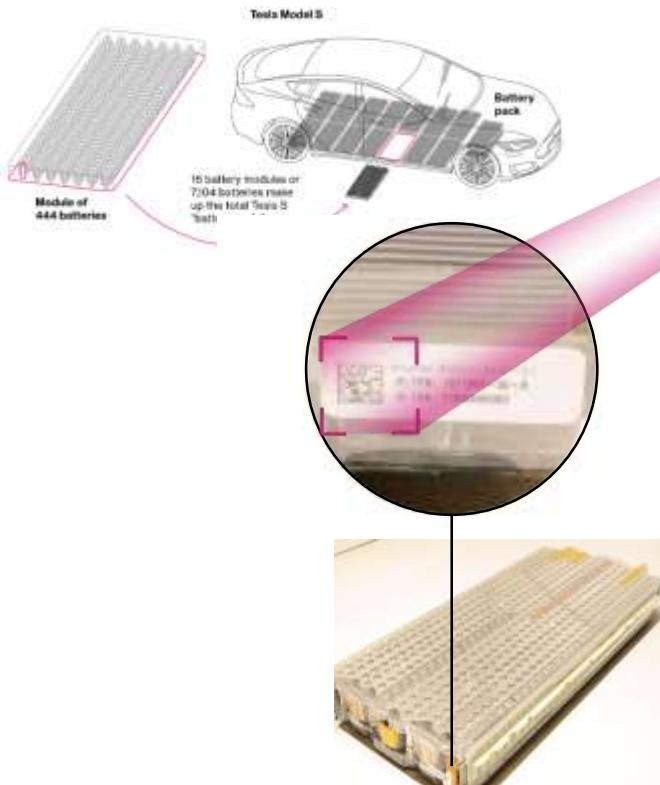
Battery Traceability @ Maintenance

Tesla Model S

Battery pack

Old Module

New Module

To be sent to repurposer

OPTEL Module Replacement

Pack ID :

New Modules ID :

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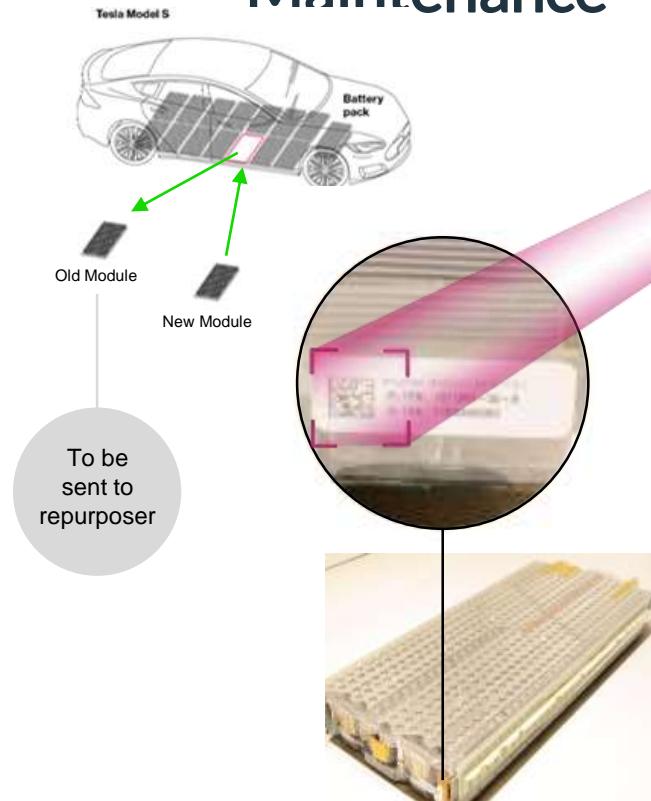
Battery Traceability @ Repurposer

EV Battery Lifecycle Stakeholders

NAATBatt INTERNATIONAL **Sponsored Blockchain Platform**

Battery Lifecycle Data

Production — **Collection** — **Lifestyle Extension** — **Resource Recovery**

EV Battery Mfgr	EV OEM	Dealership	Scrap Yard	Garages	Collector	Refurbisher-Auto Reuse	Repurposer-Energy Storage	Recycler-Disassembler	Recycler-Materials Recovery	EV Battery Mfgr

CATL

Ford

ISRI — Institute of Scrap Recycling Industries, Inc.
Voice of the Recycling Industry™

terrapure

INDIE POWER SYSTEMS

RETRIEV TECHNOLOGIES

Li-Cycle™

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COME LEARN MORE!

10:15 – 10:40 a.m.	Networking break

10:40 – 11:25 a.m.	**Blockchain and Battery Lifecycle Management**
	Lauren Roman, Everledger
	Kunal Phalpher, Li-Cycle
	Laura Wagner, Ford Motor Company
	Michael Paszti, Terrapure
	Bob Galyen, CATL
	Steve Tolen, Indie Power Systems
	Todd Coy, Retriev Technologies

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