Li-ion battery recycling

Corporate presentation - June 2022

Non-confidential
VEOLIA ENVIRONNEMENT, COMPANY OVERVIEW
Solutions for water, waste and energy management

220,000 employees

€38 billions turnover

5 continents

Contribute to human progress by firmly committing to the Sustainable Development Goals set by the UN to achieve a better and more sustainable future for all

Water
98* million people supplied with drinking water
67* million people connected to wastewater service

Waste
50* million metric tons of waste treated
42* millions people provided with collection on behalf of local authorities

Energy
41* million megawatt hours of energy produced
45,000* thermal installations managed

*old VEOLIA perimeter only
DEVELOP A NEW CIRCULAR ECONOMY
Matching our partners needs along the value chain

Battery production scraps

Eco-design of Batteries → Battery manufacturing → Car manufacturing → Battery utilisation → Battery extraction → Battery collection → Battery diagnostic → Battery recycling

New loop: Battery Reuse

Battery re-utilisation (2nd life)

Recycled battery precursors for new battery production

Close the loop in our partners supply chain, in compliance with future regulation and to develop safe and local raw materials supply
## FOCUS OUR SERVICES ON 3 MARKETS
Veolia actively working to solve 3 burning issues

<table>
<thead>
<tr>
<th>#1 Recycling</th>
<th>Veolia is able to collect and recycle almost all Li-ion battery technologies thanks to its internal recycling process (mechanical + hydrometallurgy)</th>
</tr>
</thead>
</table>
| #2 2nd life  | Veolia is launching experiments in 3 areas:  
- Electrical Network flexibility  
- Storage for renewable integration  
- Fast EV charging stations |
| #3 Eco design | Veolia is working with its ecosystem on the eco-design of EV batteries to facilitate its dismantling at the end of its life cycle. |

### DESCRIPTION

- Circular economical solutions on the whole value chain, tailored to our clients requirements
- Ongoing R&D projects, inhouse and with partners, for continuous process improvement and to comply with evolving regulation
- High process robustness & large tolerance to variability of Veolia process

### SPECIFICITIES

- Veolia is an expert of all the value chain of hazardous waste, thus supplying turnkey solutions and avoiding intermediaries
- Recycling costs are eliminated, at best some revenue can be generated
- The environmental footprint of the battery is reduced

### OPERATIONS

- Actual capacity of 30,000t/year
- Plants in Europe & China (coming soon in USA)
- Scraps & EoL batteries
- POCs under construction with partners in France & UK
- Veolia won’t work on battery remanufacturing (sub-contractors identified)

- Recycliing made easier and therefore cheaper
- More materials will be recovered
- Materials payback to partners will increase

Veolia involve in the ecosystem and on specific R&D projects with OEM’s

Environmental services to reduce footprint (waste / water) from battery production
VEOLIA’S EVB RECYCLING FOOTPRINT
3+1 plants dedicated to EVB, many ongoing projects

Existing partnerships:

- **UK - Minworth**: Mechanical recycling, Eq. 10k tons of EVB
- **China - Jiangmen**: Mechanical recycling, Eq. 25k tons of EVB
- **France - EDI**: Mechanical recycling, Eq. 5k tons of EVB
- **France - CEDILOR**: Chemical recycling, Eq. 20kt of EVB
#1 CLOSE THE LOOP OF RECYCLING
Battery to battery production with VEOLIA unique know-how

![Diagram showing the recycling process]

**Veolia**

**Production:** plastics, steel, electronics, aluminium, copper, NMP + salts of Ni, Co & Li

**Inhouse**
- 2 plants in France
- 1 plant in China
- 1 plant in UK (construction)

**Projects (North America, Asia & Europe)**

**Partners**
- Additional purification process
ADAPT LOGISTIC TO CUSTOMERS
3 types of recycling unit available to massify volumes

**Dismantling units - Local**
- Local
- On-site & Off-site

**Mechanical units - Regional**
- Regional
- On-site & Off-site

**Hydrometallurgy - Continental**
- Continental
- Off-site

---

**Battery discharging & disassembly**

---

**In:** Full battery

**Out:** Battery cells or modules

---

**Mechanical separation of materials**

---

**In:** Battery cells

**Out:** Black Mass

---

**Chemical separation of materials**

---

**In:** Black Mass

**Out:** Battery grade salts

---

**EV**

- Casing and electrical wires
- Battery cells

---

Copper, Aluminium, Plastics

**Black Mass** (mix of Ni, Li & Co)

---

Black Mass

---

Purified salts of Ni, Li & Co (from low to battery grade)

---

Metals/Salts
Veolia’s "Always Safe" safety policy, aims at improving the safety of each employee at their workstation and guaranteeing a work environment promoting health preservation.

Veolia deploys a health and safety system for comprehensive and efficient management, and relies on audit programs and corrective measures:

- Objective of reducing the accident frequency rate by 10% per year and results included in the variable portions of managers’ pay.
- Safety management leveraging qualitative objectives based on the 10 Group standards
- Health & safety audit program led by corporate and operational entities

SAFETY IS OUR NUMBER ONE PRIORITY
Our employees are our most valuable resource