



# ReLioS e.V. – Network for circular economy of lithium-ion battery systems and future technologies

*Image sources: mk-group.com, agora-verkehrswende.de*

KOMBiH Power Hour

20.02.2025

# Agenda



1. ReLioS – Netzwerk für Kreislaufwirtschaft von Lithium-Ionen Batterien und weiteren Zukunftstechnologien
2. Intrinsische Motivation
3. Spezifische Partnerstruktur
4. Aktuelle Themen
5. Anstehende Aktivitäten
6. Kontakt

## Battery-Network ReLioS e.V.

stands for

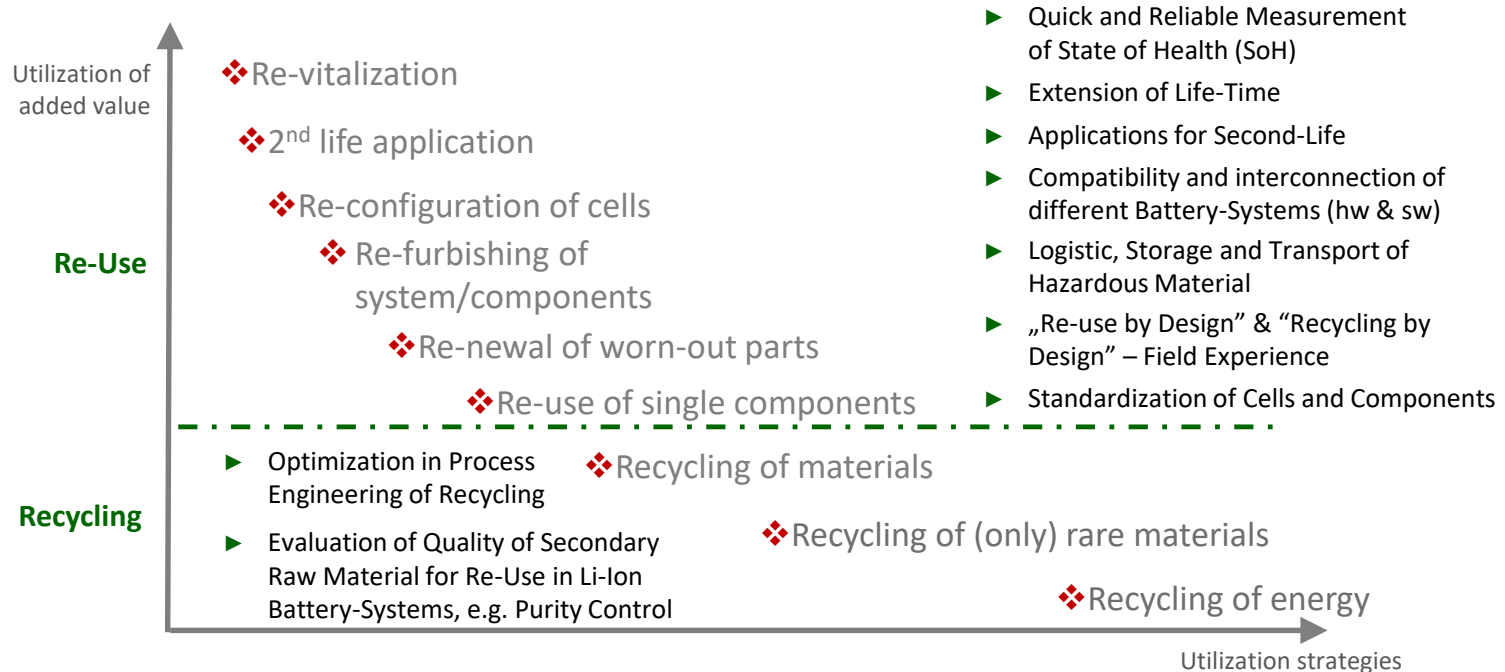
- association of **companies** and **scientific institutions**
- personal **contact network**
- exchange to develop **business opportunities** and initiate **research and testing projects**
- promoting **regional cooperation**
- development of **value creation** in Brandenburg and Germany in close cooperation with international leading partners
- joint **public relationship** management



# Alternative utilization strategies – technology issues



**Task:** State-dependent selection of the utilization strategy under "benefit cost aspects"





# ReLioS – German partners

*Diverse industrial and scientific competences along the value-chain*



- Specialised in the solution and realization of customized adhesive tape demands and applications
- laminating, winding and cutting
- die cutting and lasering
- mounting
- Supplier of vendor parts for the automotive sector



- Transport services by road and rail with a focus on transports between hinterland and German seaports v.v.
- intermodal network with own assets
- Transports of dangerous goods and waste
- Sustainable transport solutions



- Handling and storage of containers, swap bodies and trailers
- Hazardous materials storage
- Repair, inspection of sea containers in accordance with CSC
- Transfer of free-flowing products with tipping platform chemical analysis of battery materials



- Battery testing along the entire TIC service chain from development-related testing over homologation / certification to quality assurance
- Mechanical, Environmental, Electrical, Performance and Abuse Testing



Brandenburgische Technische Universität  
Cottbus - Senftenberg  
department of physical chemistry

- recovery of anode and cathode materials from dismantled battery cells
- chemical analysis of battery materials



- Factory automation
- Process automation
- technical training and development

RE-USE AND RE-CYCLING OF LI-ION-BATTERY SYSTEMS



[www.relios.org](http://www.relios.org)



Bundesanstalt für Materialforschung und -prüfung

- Online characterization of chemical composition
- Laser induced breakdown spectroscopy
- Ambient mass spectrometry
- Modeling & simulation



- Integration of LiFeMnPO<sub>4</sub> Batteries
- Market development
- Battery installation and sales



- Independently operating IT service provider
- Core competence in digitalization of development processes in engineering and manufacturing as well as PLM
- PLM & PDM strategy and system consulting, End-to-End solutions, quality management and testing, product certification, digital twins and GreenPLM®

Automatisation fast as light

- laser machines for battery recycling and reuse:
  - Improving existing solutions: Welding, unwelding, cutting, smoothening, weakening glue etc.
  - R&D of new solutions



Lehrstuhl Umweltgerechte Produktionstechnik

- Use of state-of-the-art technical equipment in research and development projects, especially for SMEs Technologies:
- Focus on application-oriented solutions in the field of environmentally friendly production technology and process innovation



- Structural and technical Fire protection
- Sensors for battery monitoring
- Examination of cells for damage



- Strategic Technology and Innovation Management
- Grant Management
- Network manager in Germany



# ReLioS – Korean partners

*With high dynamics in electromobility*



## EcoPro CnG

- Construction of total closed loop system for Li ion battery industry
- Cell dismantling and recovery of valuable metals
- Supply core materials for cathode active materials of Li ion battery



- Cell and pack system for special use and industrial area
- Cell manufacturing using recycled materials



- Recycling of Materials
- Characterization and Analysis of Recycled Materials
- Fabrication and Evaluation of LiBs using Recycled Materials



- Development of power IT, new and renewable energy system technology
- Provision of testing and certification services on electrical devices...
- Li-ion battery recycling

## DAEGU MECHATRONICS & MATERIALS INSTITUTE

- R&D Support
- Testing and Performance Evaluation
- Technology transfer and consultation
- Re-use of Li-ion battery

RE-USE AND RE-CYCLING OF LI-ION-BATTERY SYSTEMS



[www.relios.org](http://www.relios.org)



- Battery total Solution
- Factory Automation



- Li-Ion Battery Recycling
- Waste Battery Mechanical Shredding and Hydrometallurgy



- Recycling of Li-ion batteries
- Recover Li, Co, Mn, Cu from wasted Lithium secondary battery by hydrometallurgy
- x-EV Battery dismantling process



- Development of high performance batteries
- Optimization of manufacturing process



- Remanufacturing battery pack from Waste EV Battery
- Residual value solution for Electric vehicle
- Electric vehicle Battery sharing economy business



- Battery and energy storage industries
- lithium battery diagnostic solutions for EVs, ESS, redox flow batteries, and fuel cells
- Battery diagnostic solution
- Leads globally in Battery diagnostics

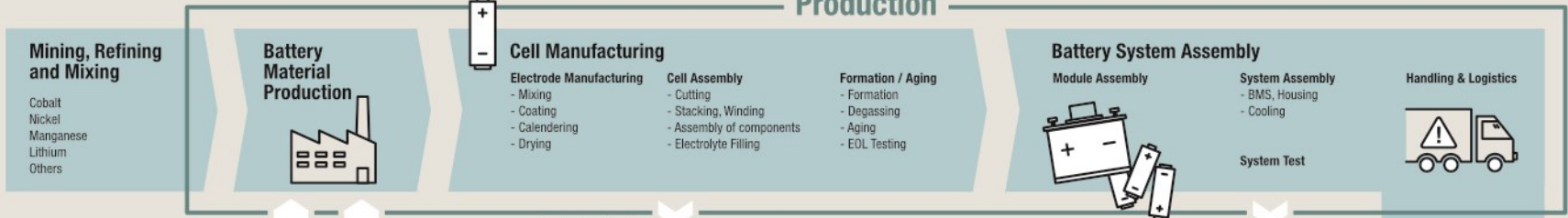


- Development of technology for evaluating the performance of used battery
- ReEstablishment of Resource Circulation System for Electric Vehicle Battery



- Adjacent to EV's battery material producing companies
- Adjacent to "Lithium-ion battery recycling cluster"

# Production



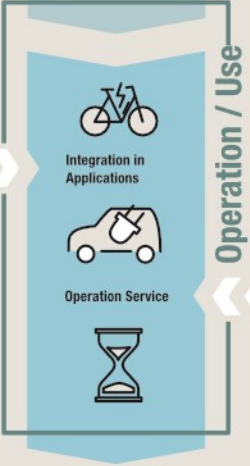
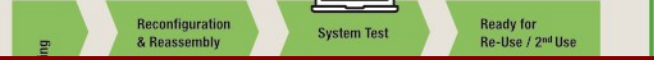
Production Waste 30% Recycling

Recycling

## Recovery cathode & anode materials

Cobalt

## Re-Use/2<sup>nd</sup> Use



**Batteriezellenwerk**

Hersteller und Zulieferer von Batteriepacks, -modulen und -systemen

**Aktivmaterialien**

**Anwender** (Fahrzeughersteller, Kraftwerk)

**Ausrüster** (Produktions-, Automatisierungstechnik [Hardware, Software], Produktionslogistik, Brandschutz)

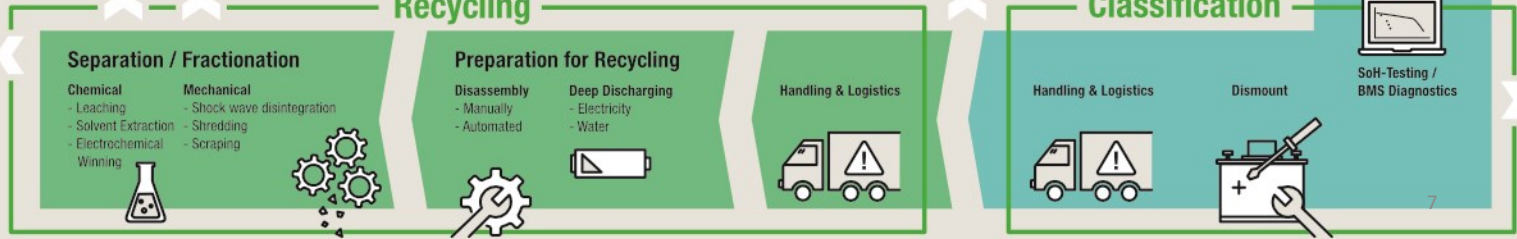
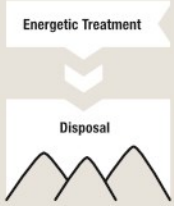
**Engineering, Test, Diagnose, Qualitätskontrolle**

**Logistik**

**Re-Use, Batterierecycling**

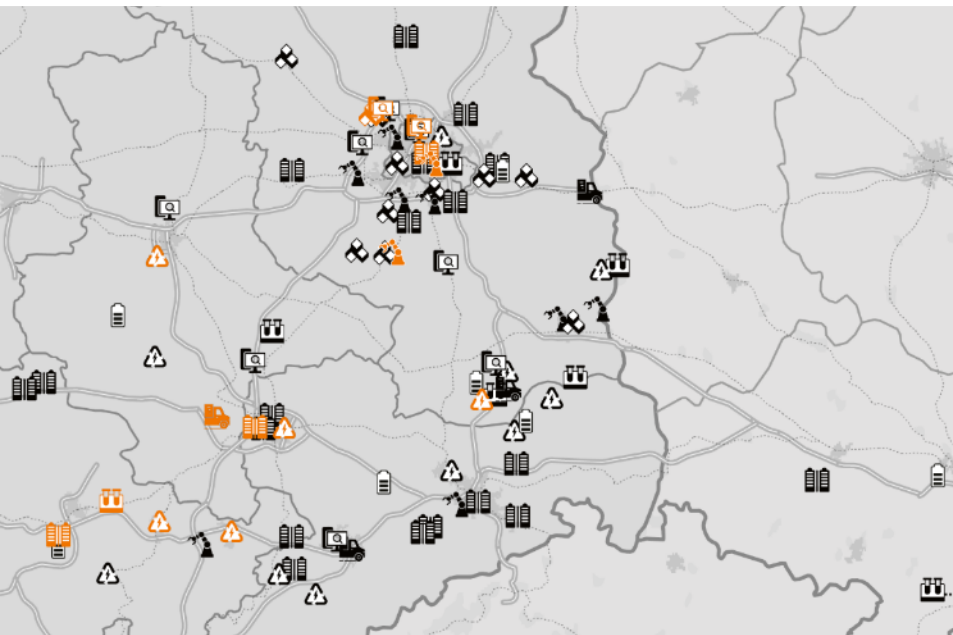
## Recycling

## Classification



# Companies in area of investigation

## Comparison 2024 vs. 2023



### Batteriezellenwerk

Hersteller und Zulieferer von Batteriepacks, -modulen und -systemen

### Aktivmaterialien

Anwender (Fahrzeughersteller, Kraftwerk)

Stand Januar 2023

Ausrüster (Produktions-, Automatisierungstechnik [Hardware, Software], Produktionstlogistik, Brandschutz)

Engineering, Test, Diagnose, Qualitätskontrolle

Logistik

Re-Use, Batterierecycling

bis Januar 2024 neu hinzugekommen

### Berlin

- Alba Berlin GmbH
- Aucoteam**
- Autarsys GmbH
- BANLabs GmbH
- Berliner Verkehrsbetriebe BVG
- Batteries Amps GmbH
- BMW Motorrad
- Bundesanstalt für Materialforschung und -prüfung, BAM
- Clean Energy Global**
- Circular
- Constin GmbH
- embeddeers GmbH
- IAV GmbH  
Ingenieurgesellschaft Auto und Verkehr
- Jonas & Redmann  
Automationstechnik GmbH
- Laser Microtechnic GmbH**
- Mektec Group
- Okai GmbH
- Photon AG
- Siemens Mobility
- Stadler Deutschland GmbH
- Theion
- Tier Mobility SE

### Brandenburg

- Alstom, Henningsdorf
- BASF Schwarzheide GmbH, Schwarzheide
- BASF Schwarzheide GmbH, Schwarzheide**
- Bertschi STR, Schwarzheide
- Botree Cycling Sci & Tech., Ltd., Guben
- DAM Diehl Advanced Mobility GmbH, Zehdenick
- Dekra (Lausitzring), Klettwitz
- eROCKIT Systems GmbH, Henningsdorf**
- E.DIS AG, Fürstenwalde

### Brandenburg

- EV Cargo, Frankfurt (Oder)
- Forster System-Montage-Technik GmbH, Forst (Lausitz)
- G.B.S. Gesellschaft für Brandschutz und Sicherheit Handelsgesellschaft mbH, Ludwigsfelde
- Genius Technologie GmbH, Rangsdorf
- Gustav Scharnau GmbH, Werneuchen
- Havel metal foam GmbH, Brandenburg a.d.Havel
- Hüffermann Transportsysteme GmbH, Neustadt (Dosse)
- HESCO-Kunststoffe, Luckenwalde**
- IBAR Systemtechnik GmbH, Cottbus
- InMediasP GmbH, Henningsdorf**
- K - electronic GmbH, Königs Wusterhausen
- LEAG (Energy Cubes), Cottbus
- Mercedes-Benz Ludwigsfelde GmbH, Ludwigsfelde
- Microvast GmbH, Ludwigsfelde
- Regionales Regelkraftwerk Feldheim (RRKW), Treuenbrietzen
- ReMetal Deutschland AG, Schipkau
- Remondis, mehrere Standorte
- Rock Tech Lithium, Guben
- RollsRoyce Deutschland Ltd. & Co. KG, Blankenfelde-Mahlow
- Rosenbauer Deutschland GmbH, Luckenwalde
- Stöbich Technology GmbH, Potsdam-Golm
- SVOLT Energy Technology (Europe) GmbH, Lauchhammer
- Tesla Gigafactory Berlin-Brandenburg, Grünheide

### Brandenburg

- Tesla Gigafactory Berlin-Brandenburg, Grünheide
- Tesla Gigafactory Berlin-Brandenburg, Grünheide
- Testgelände Technische Sicherheit, Baruth (Mark)
- Witt Solutions GmbH, Wustermark

### Sachsen (Auswahl)

- Accumotive GmbH & Co. KG, Kamenz
- Altech Advanced Materials AG, Schwarze Pumpe (Spreetal)
- BEC Becker Elektrorecycling Chemnitz GmbH, Chemnitz
- Blackstone Ressources, Döbeln
- BMW Leipzig, Leipzig
- Dräxlmaier Batteriewerk Leipzig, Leipzig
- ERLOS GmbH, Zwickau
- FiberCheck GmbH, Chemnitz
- Infineon Technologies AG, Dresden

- Intilion GmbH, Zwickau
- IT Energy Systems, Bobritzsch-Hilbersdorf
- Leadec Services GmbH, Hoyerswerda
- Lioft GmbH, Kamenz
- Litronik Batterietechnik GmbH, Pirmas
- LRP Autorecycling, Leipzig**
- REELEMENTS GmbH, Radebeul
- Nickelhütte Aue GmbH, Aue
- Scaba GmbH, Dresden
- Skeleton Technologies GmbH, Großröhrsdorf
- Skeleton Technologies GmbH, Markranstädt**
- Triathlon Batterien GmbH, Glauchau
- Tricera energy GmbH, Bobritzsch-Hilbersdorf

### Thüringen (Auswahl)

- CATL, Arnstadt
- EAS batteries, Nordhausen
- Fortum Battery Recycling, Artern**
- Glatt Ingenieurtechnik GmbH, Weimar**
- KEDALI Germany GmbH, Amt Wachsenburg**
- Maschinenbau Kitz GmbH, Lederhose
- RVA-Energietechnik GmbH & Co.KG, Nordhausen
- SungEel HiTech, Gera**

### Sachsen-Anhalt (Auswahl)

- AMG Lithium GmbH, Bitterfeld-Wolfen
- Ecobat, Hettstedt
- elfolion GmbH, Quedlinburg
- FEV Software und Testing Solutions, Brehna-Sandersdorf
- HORIBA Fuel Con GmbH, Barleben
- KTSX GmbH, Schkopau (Leuna)**
- Li-Cycle, Sülzetal (b. Magdeburg)**

### Polen (Auswahl)

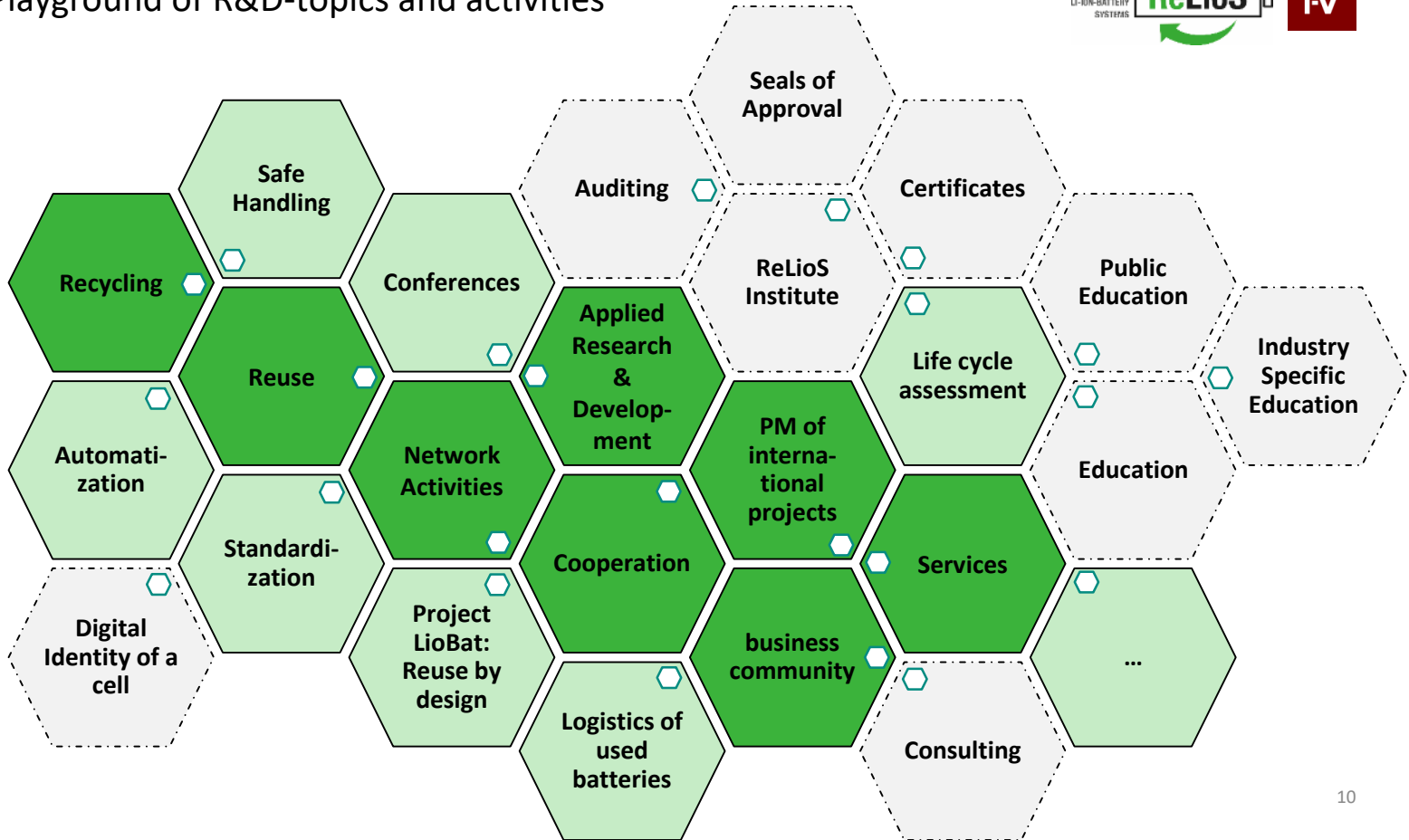
- LG Chem, Wroclaw (Breslau)
- Mercedes Benz Manufacturing Poland, Jawor (Jauer)
- Umicore AG & Co. KG, Nysa, Opole (Polen)

# Research institutes, test labs in area of investigation



- **28 research institutes** with reference to battery-ecosystem, therefore:
- 8 in Brandenburg, 6 in Berlin, 13 in Saxonia, 1 other

# Playground of R&D-topics and activities



## ReLioS – Expert Forums



- 👍 1. **Battery logistics/ safety**
  2. Digitalization/digital twin/„battery-pass“
- ⇒ 3. Test/ diagnosis/ certification
- 👍 4. **Recycling processes – comparison and properties of recycling processes**
  - Perspective: market and technology research
  - Further suggestions from the participants

# Logistic



# Battery Repair





## Activities 2024



- General meeting, 10<sup>th</sup> January
- Business trip Südkorea 3-8<sup>th</sup> March, **Interbattery Seoul**
- **ReLioS-Meeting**, 24<sup>th</sup> May, **Lausitzring** with support of DEKRA and Gustav-Scharnau GmbH
- **ReLioS-Conference and Fair-Tour 19./20.6.2024**  
**Munich/Stuttgart: Interbattery** at Smarter E Europe, Munich – **Battery Show** Stuttgart –  
6. **ReLioS-Conference** at Fraunhofer IPA, Stuttgart
- **Logistics Expert Forum** (17.5., 28.8., 2.12.)
- 5. **Future Battery Forum**, 5.-6.11., Berlin
- 7. ReLioS-Conference & **Company-Tour**, 1.-6.9., Südkorea
- **Recycling Expert Forum** (25.11.)



## Upcoming activities 2025



- **InterBattery Seoul, 5.-7.3.2025, joint booth**

2025  
INTERBATTERY

- **Logistics Expert Forum (1<sup>st</sup> quarter 2025)**
- **Recycling Expert Forum (1<sup>st</sup> quarter 2025)**
- **General meeting (2<sup>nd</sup> quarter 2025)**
- **ReLioS-Meeting, May 2025 (i.e. Lausitzring or 3M)**
- **InterBattery Europe, 6.-8.5., Munich**
- **5. Batterieforum Berlin-Brandenburg, 20.5., Berlin**
- **Battery Show Europe, Stuttgart, 3.-5.6.2025**
- **6. Batterieforum Berlin-Brandenburg, 11/2025, Brandenburg**
- **6. Future Battery Forum, 25.-26.11.25, Berlin**



# Haben wir Ihr Interesse geweckt? Dann melden Sie sich!

## ReLioS e. V. Board Members



DIPL.-ING.  
CARL-ERNST FORCHERT

**Managing Director**

i-vector  
Innovationsmanagement GmbH

Telefon: +49 30 22 500 321

E-Mail: forchert@relios.org

Web: [www.i-vector.de](http://www.i-vector.de)



PROF. JUNG-HWA  
LEE PH.D.

**Scientific Expert**

Berliner Hochschule für Technik  
(BHT), Automation Technology

Telefon : +49 30 45 045 185

E-Mail: lee@relios.org

Web: [www.bht-berlin.de](http://www.bht-berlin.de)



ANTJE  
ROETTCHER

**Key Account Management  
International**

Stöbich Brandschutz GmbH

Telefon : +49 5321 5708 1964

E-Mail: roettcher@relios.org

Web: [www.stoebich.com](http://www.stoebich.com)

## Networkmanagement



DIPL.-ING.  
ANGELA BLUME

**Projectmanagement**

i-vector  
Innovationsmanagement GmbH

Telefon : +49 30 22 500 323

E-Mail: blume@relios.org

Web: [www.i-vector.de](http://www.i-vector.de)