Battery Recycling

A building block for sustainability

SIEMENS

Mobility evolution

New business models in the age of e-mobility revolutionize entire markets

Formerly - Today

- Combustion
- Refuel
- Driving a car
- Disposal

Mobility
EVOLUTION

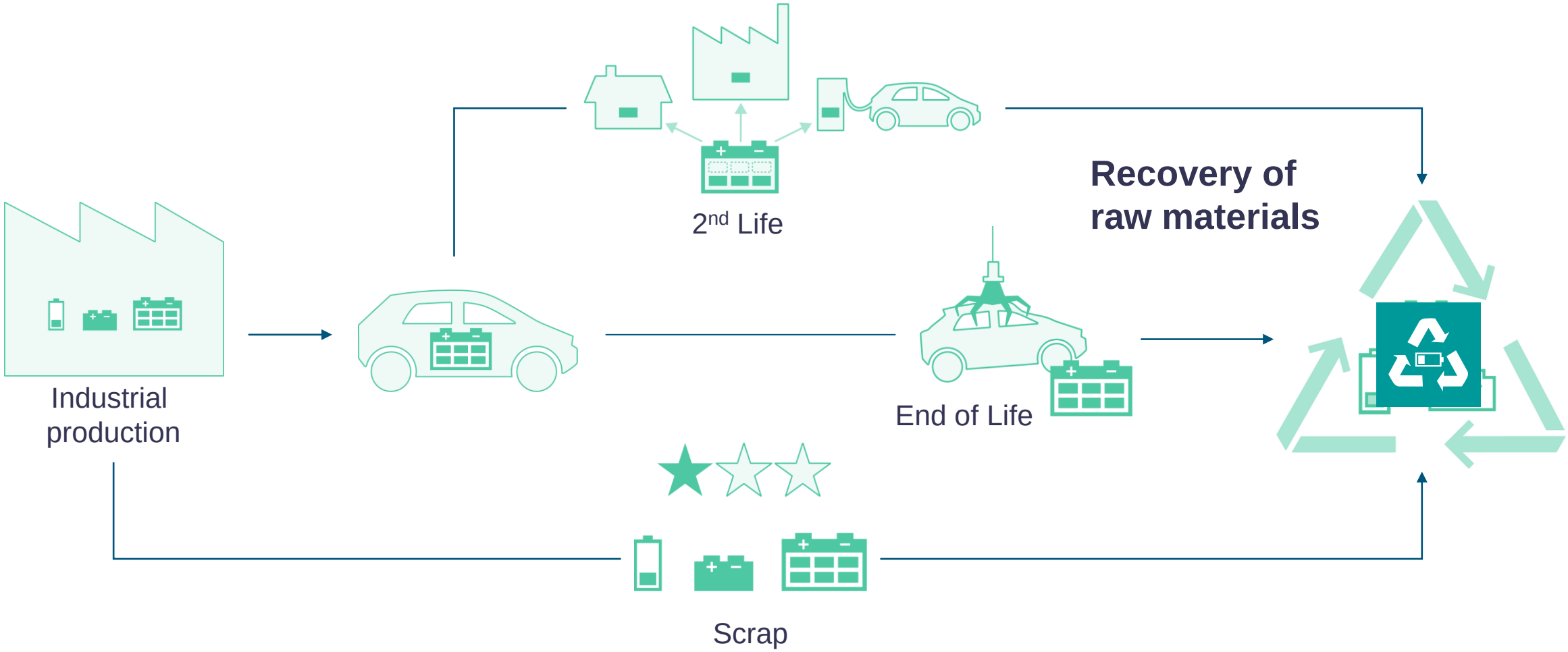
Today - Future

- Battery
- Charging
- Autonomous
- Recycling economy

SIEMENS

Recycling batteries

The recycling process is supplied by different residual material streams

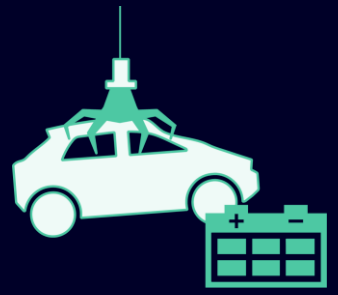


SIEMENS

Hybrid recycling process

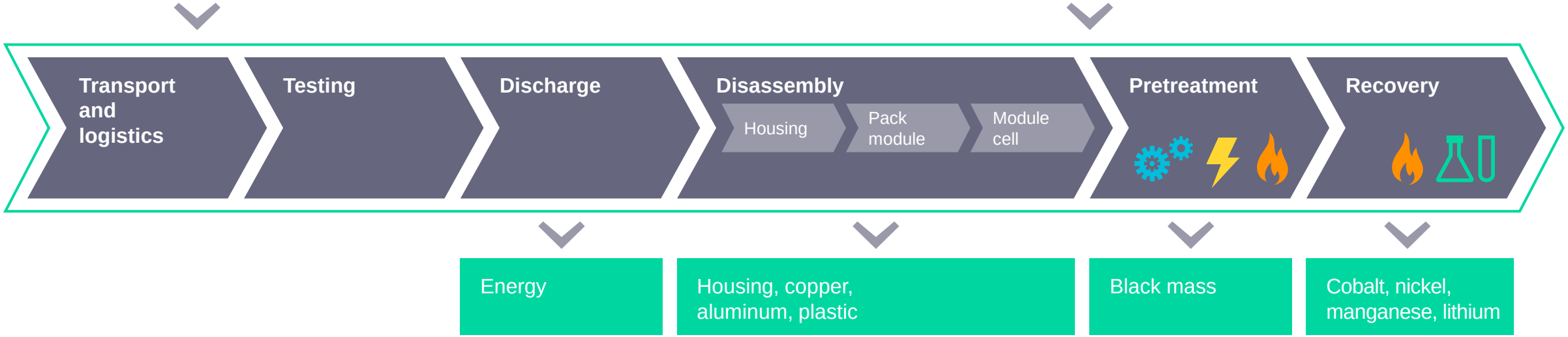
Battery recycling requires expertise in both discrete and continuous processes

Input



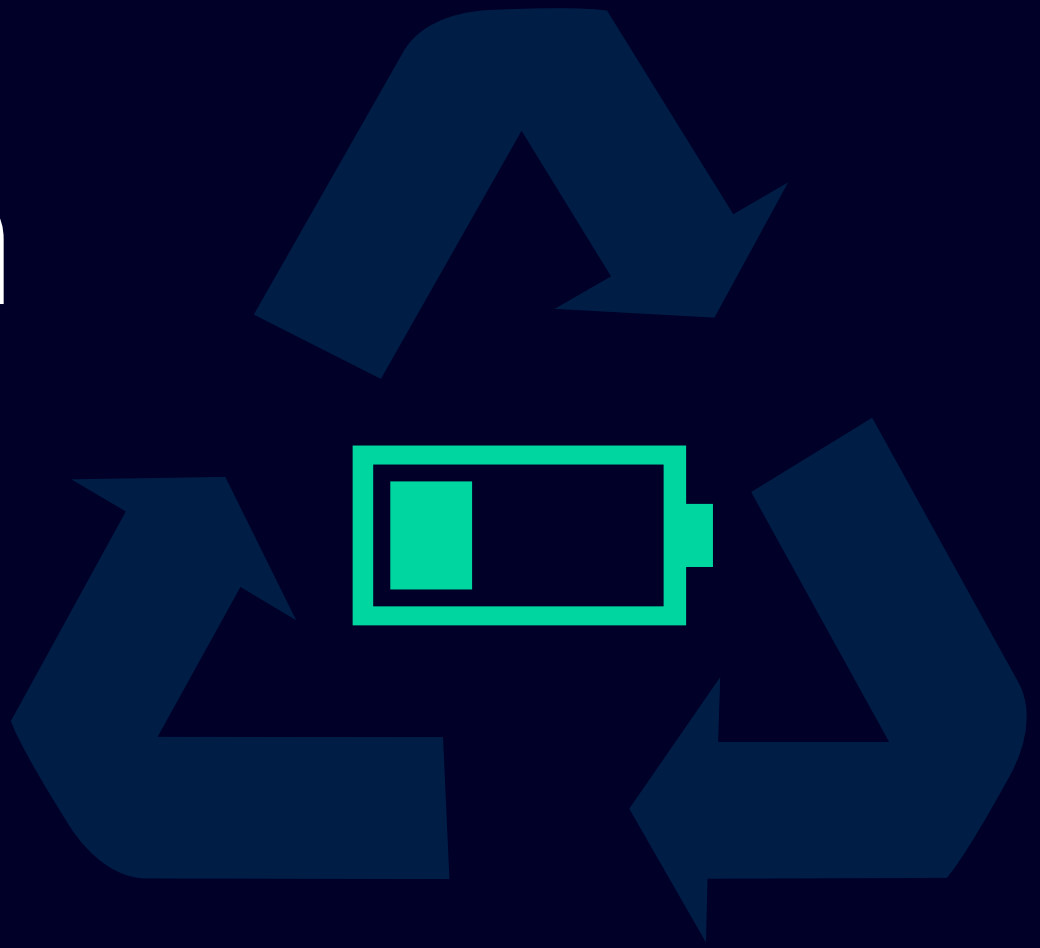
End of Life

Scrap



SIEMENS

What contribution does Siemens Make?



SIEMENS

Logistics processes in recycling
Transparency in logistics processes

Plant Simulation | PLCSIM Adv. + NX/MCD | Defense in Depth | TIA Portal | Battery guideline

Visualization
Innovative design independent of operating device based on HTML5

Robot integration
Control of the disassembly robots by the control system

Energy suite
Display of the battery status through simple projecting instead of programming

SINAMICS
Feed of residual energy back into the grid or an energy storage unit

RFID
Determination of battery category

T-CPU
Sophisticated motion control in the disassembly process

MES systems
Transparent production processes

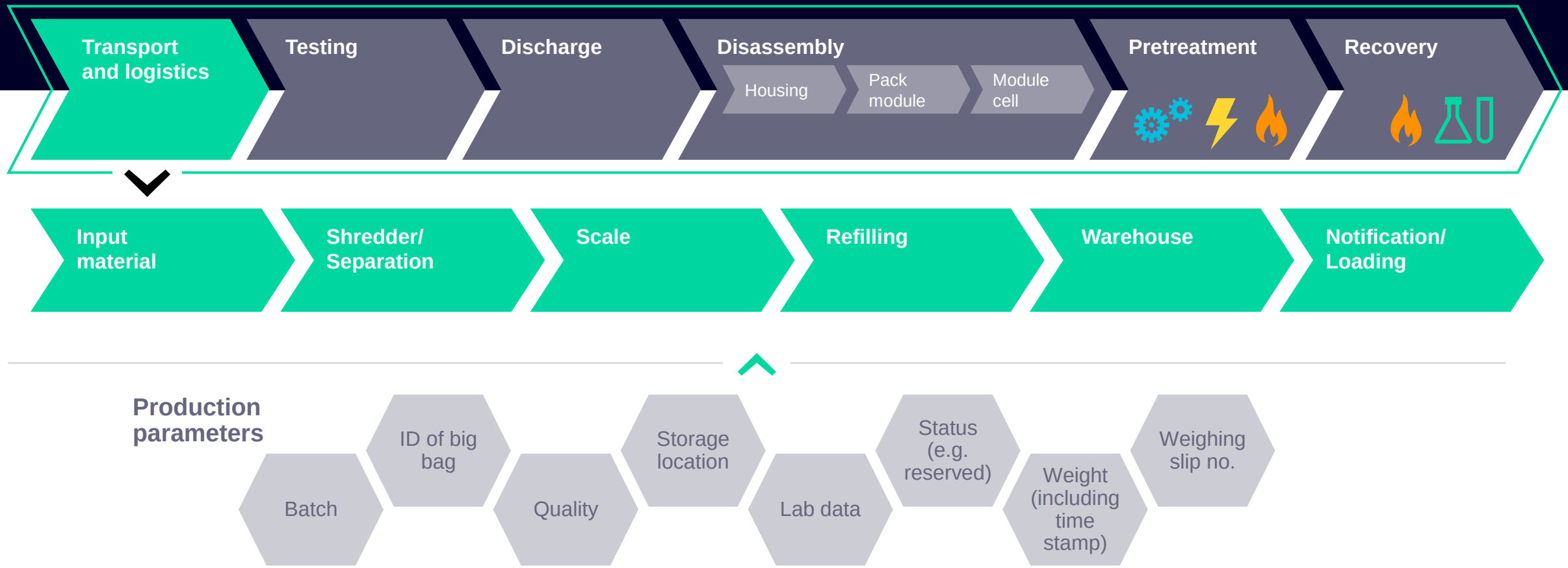
AI
Individual disassembly

RTLS
Localization of the battery in the process

SIEMENS

Logistics processes in recycling

Tracking of the material through the entire production process



SIEMENS

Discharge
Recovery of residual energy from pack, module and cell

Plant Simulation | PLCSIM Adv. + NX/MCD | Defense in Depth | TIA Portal | Battery guideline

Energy meter
Integration of energy measurement systems into automation technology

Roboter integration
Control of the disassembly robots by the control system

Energy suite
Display of the battery status through simple projecting instead of programming

SINAMICS
Feed of residual energy back into the grid or an energy storage unit

RFID
Determination of battery category

T-CPU
Sophisticated motion control in the disassembly process

Records
Communication with the battery

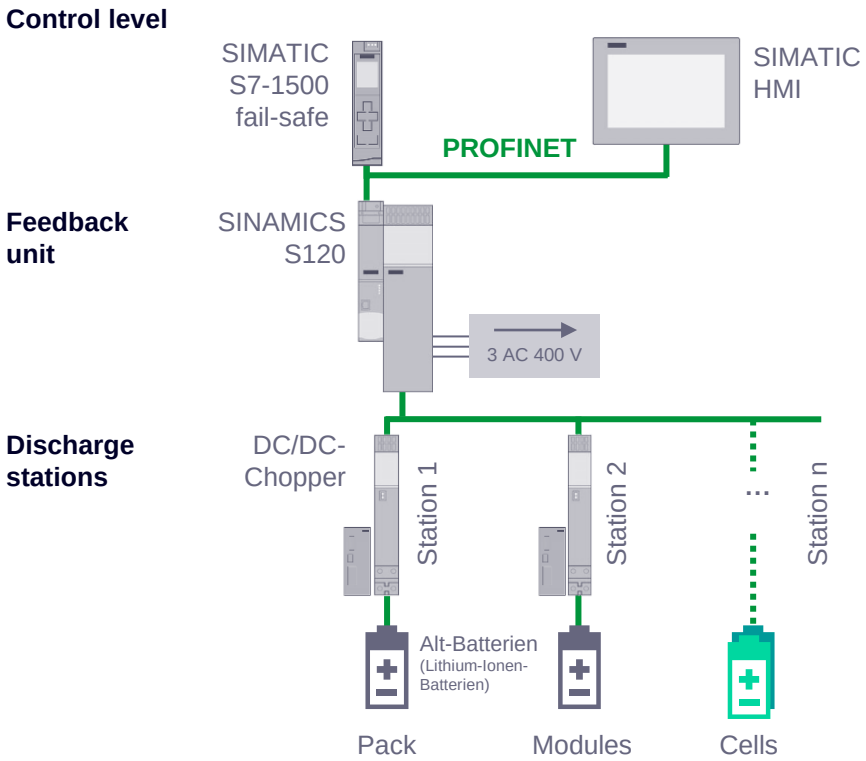
AI
Individual disassembly

RTLS
Localization of the battery in the process

SIEMENS

The consistency and scalability of discharge allows flexible use in production processes

Discharge



Modular and scalable approach adapts
discharge capacities to volatile or growing market conditions.

Environmentally-friendly reuse
of residual energy due to feeding back into the grid

Fail-safe systems
monitor the process and protect man and machine.

Possibility of
fully automated discharge processes.

SIEMENS

Disassembly
Automated disassembly from pack to cell

Plant Simulation | PLCSIM Adv. + NX/MCD | Defense in Depth | TIA Portal | Battery guideline

Energy meter
Integration of energy measurement systems into automation technology

Roboter integration
Control of the disassembly robots by the control system

Digital twin
Testing the wide variety of variants using a digital twin

SINAMICS
Feed of residual energy back into the grid or an energy storage unit

RFID
Determination of battery category

T-CPU
Sophisticated motion control in the disassembly process

Protokolle
Communication with the battery

AI
Individual disassembly

RTLS
Localization of the battery in the process

SIEMENS

Further technological developments in battery recycling
are urgently needed to meet rapidly increasing demand

Logistics

Discharge

Disassembly

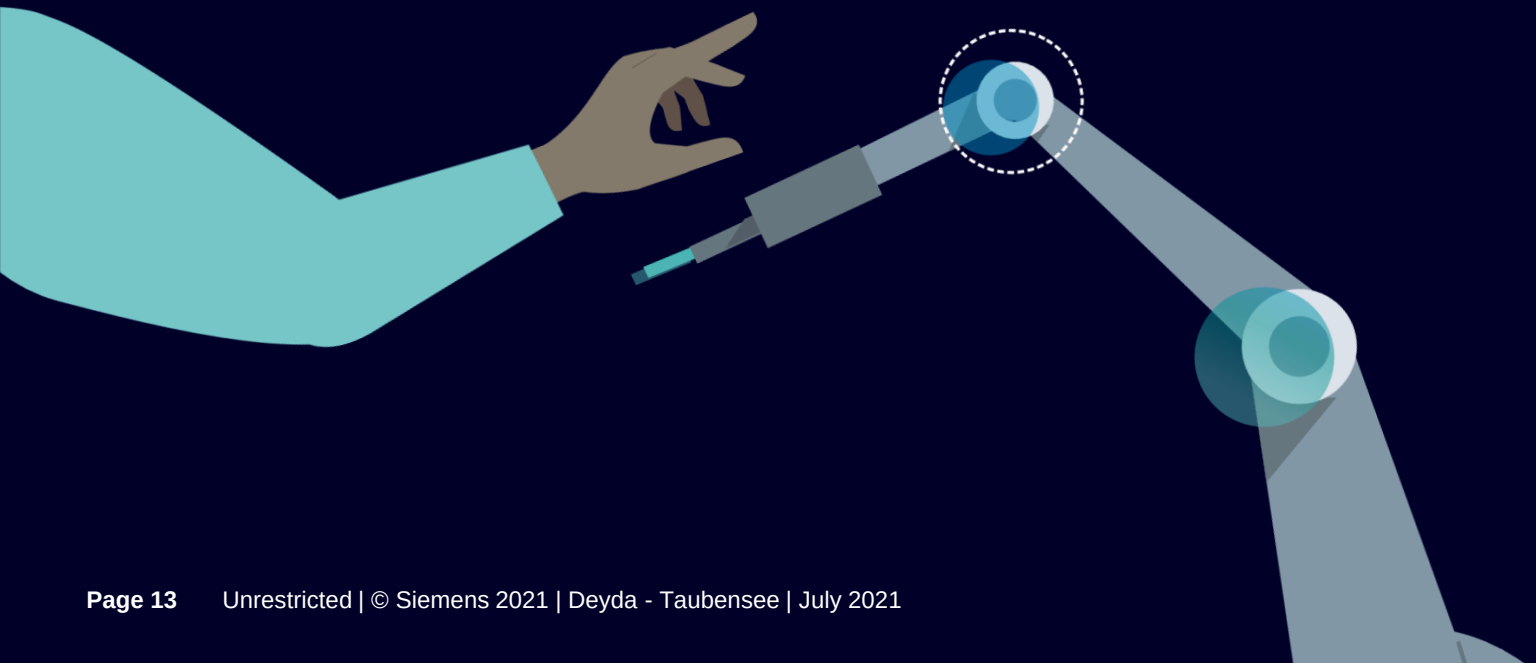
Networking

Manual process **Automation** **Digitalization**

SIEMENS

A person with a new idea is a crank until the idea succeeds …

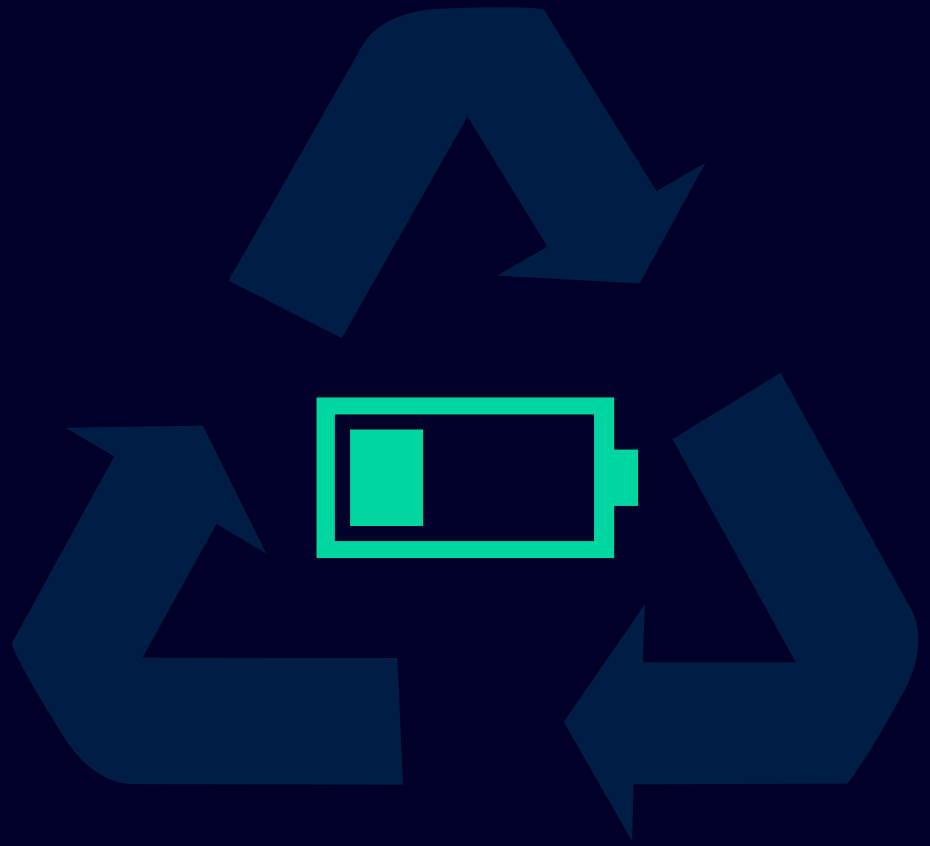
(MARK TWAIN)



… we are happy to be cranks

SIEMENS

Batterie recycling
A building block for greater sustainability



Subject to changes and errors. The information in this document only contains general descriptions or performance features, which do not always apply in the form described in the specific application or which may change due to the further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

siemens.com/battery

SIEMENS