

A close-up photograph of a battery grid, showing a complex, interconnected metal structure with various rectangular and circular openings. The grid is set against a dark red background.

BATTERY END OF LIFE SERVICES

221029

Elbilnætverket

København

It starts here.

AGENDA

Outlook

Legislation

End of life value-chain

Recycling

It starts here.

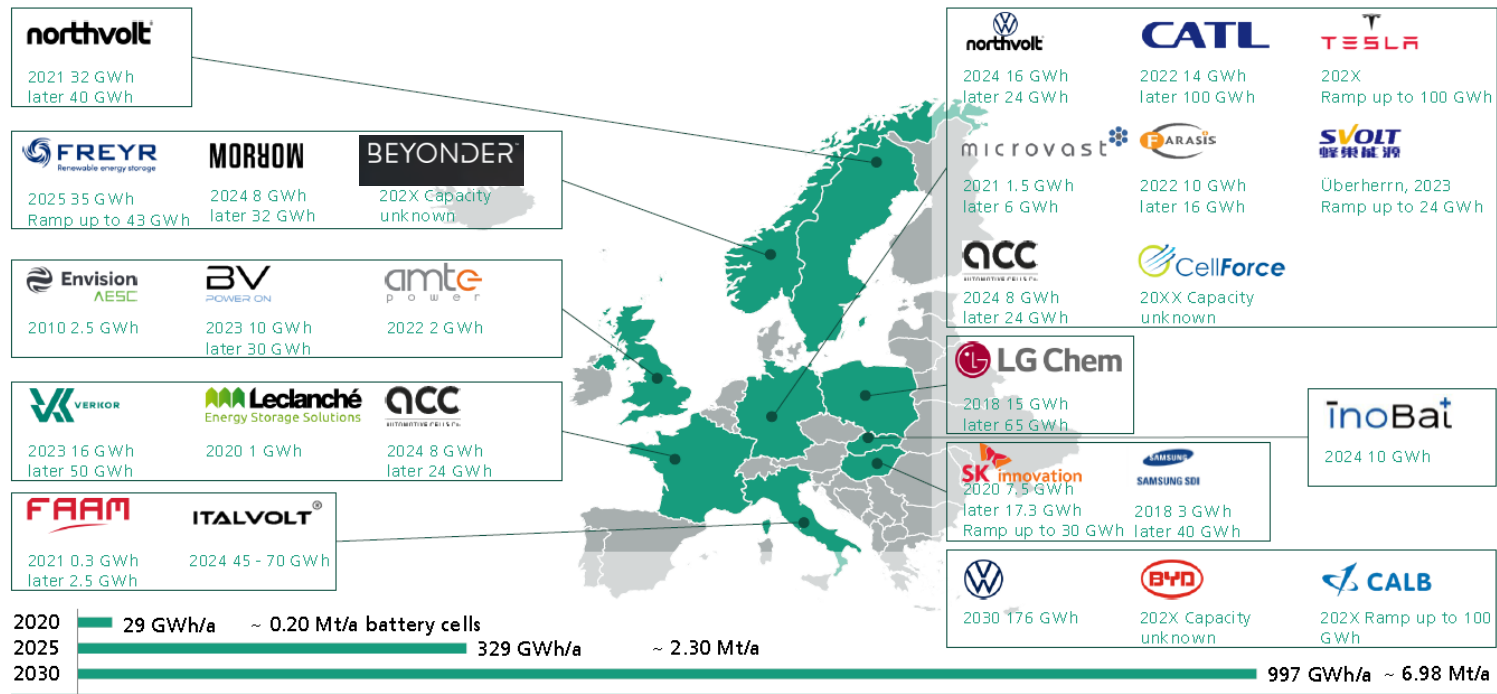
OUTLOOK

It starts here.

BATTERY PRODUCTION CAPACITY

August 2021: 1.000 GWh/a announced

with reference to Roland Zenn 2020



3
© Fraunhofer IPA

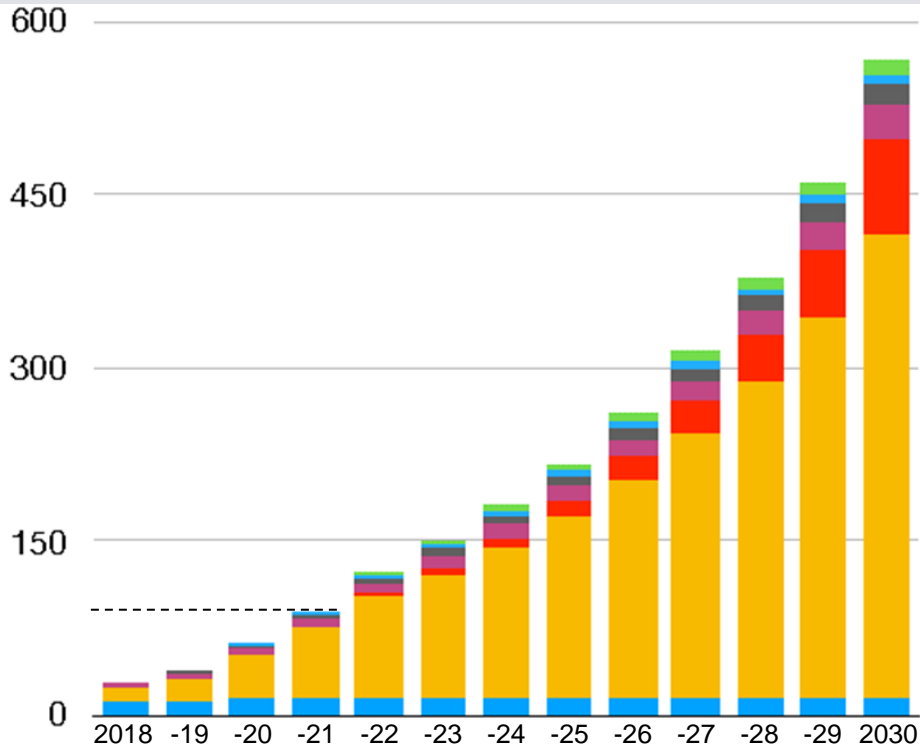
DeMoBat

Fraunhofer
IPA

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STENA
RECYCLING

BATTERIES PLACED ON THE MARKET IN EUROPE ANNUALLY, GWH



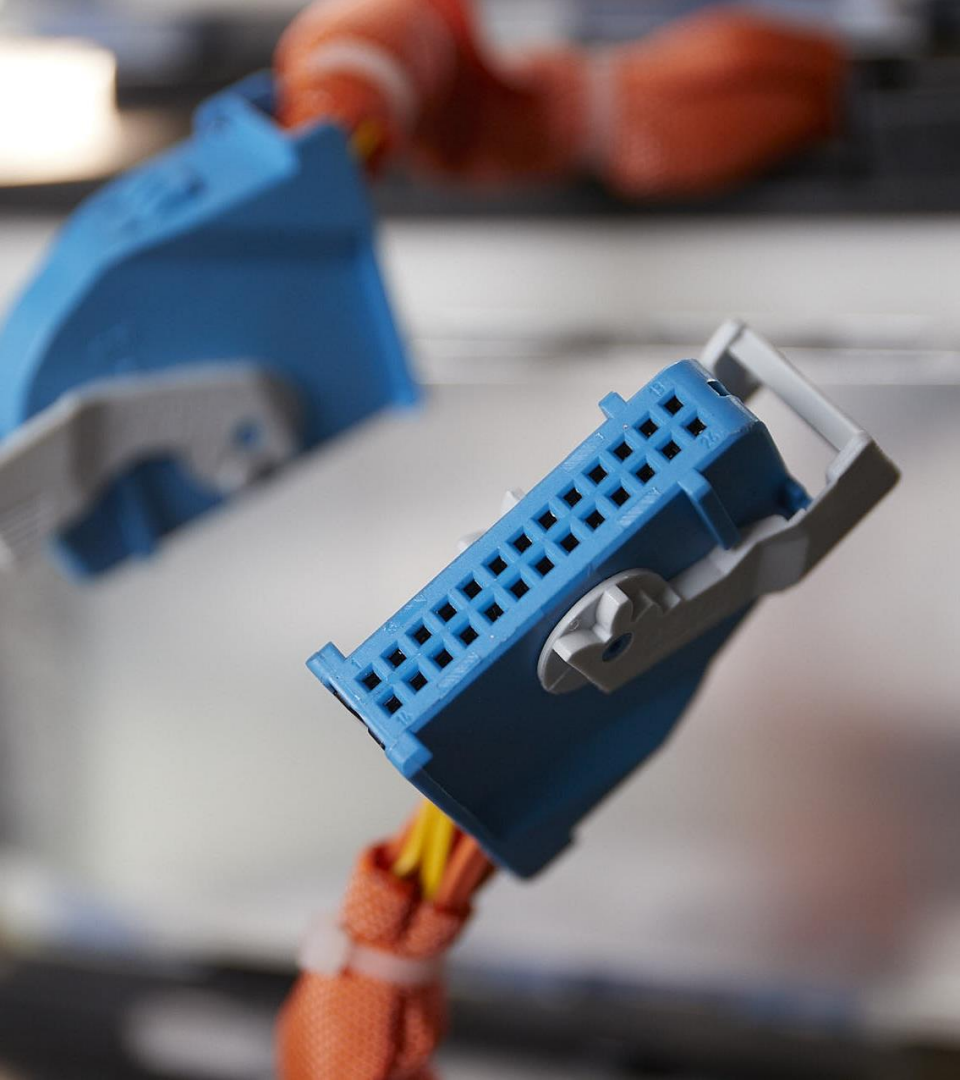
Circular energy storage

THE EVOLUTION

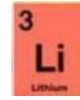
- Lithium-Ion batteries have unsurpassed energy density (10 times lead-acid)
- The energy density development is rapid and doubles approx. every ten years
 - In addition, production cost has dropped 18% annually for the last ten years

LEGISLATION

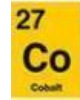
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LEGISLATIVE DEVELOPMENT SIGNATURE MATERIALS



70%



95%



95%

Too high demands

90%

98%

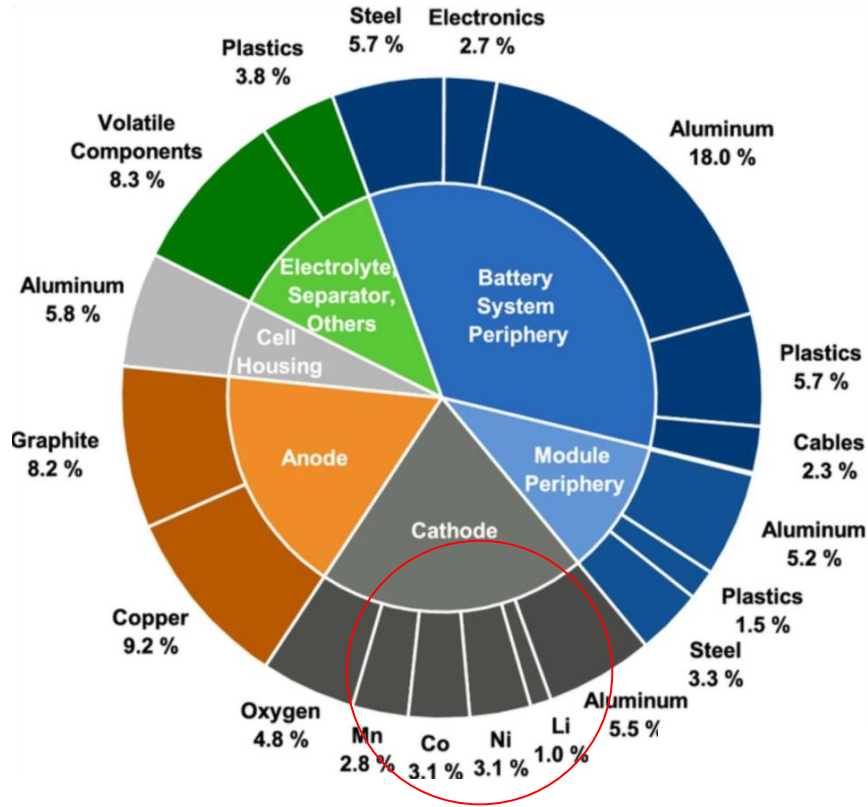
98%

Original
demands

Industry
feed-back

EU Commission
revised proposal
feb 17th 2022

FUTURE LEGISLATION



- Recycling demands:

Co:	95%
Ni:	95%
Cu:	95%
Li:	70%

- Production of new batteries:

Content of recycled metals in new batteries

Metall	2030	2035
Cobalt	12%	20%
Lithium	4%	10%
Nickel	4%	12%

It starts here.



CURRENT LEGISLATION

- Obsolete (2006)
- Enforcement level 44%
- Isolated waste legislation
- Low recycling levels

FUTURE LEGISLATION

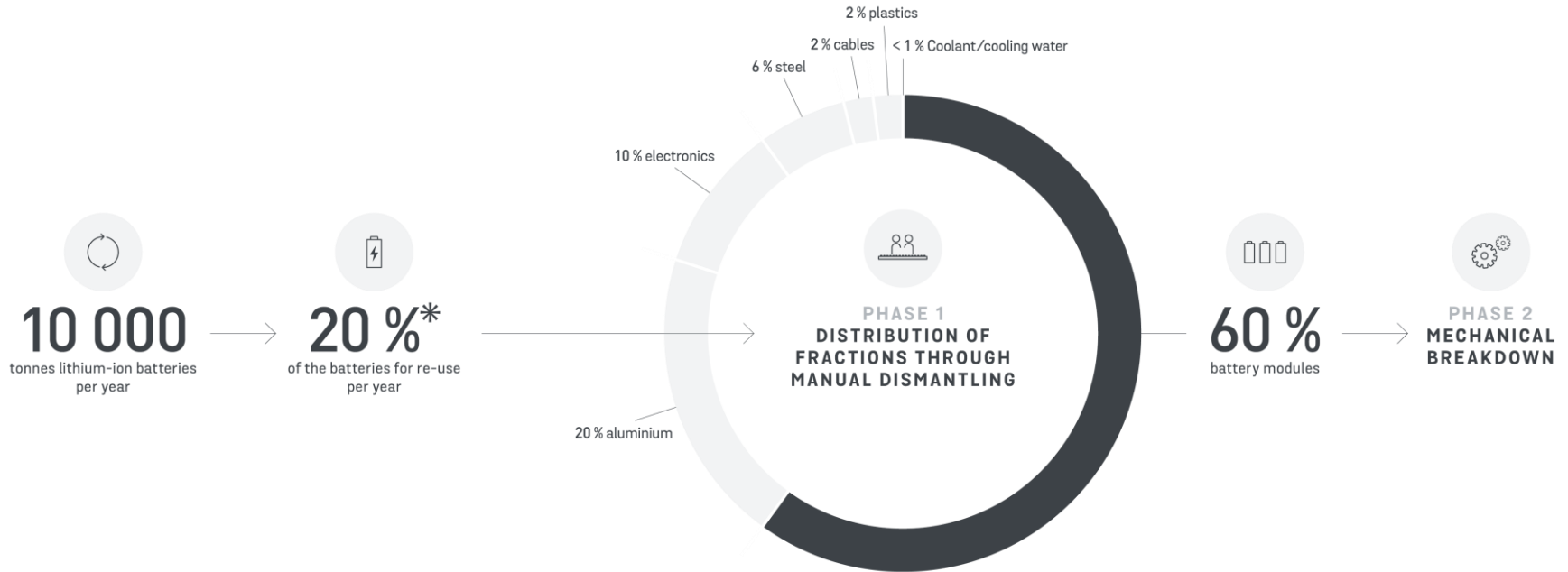
- Circular
- Traceability
- High recycling demands
- Demands for recycled content in new batteries
- Enforcement level...?

END OF LIFE BATTERY VALUE-CHAIN

It starts here.

Note: *Target level
Note: Approx. material split

STENA PRE-TREATMENT



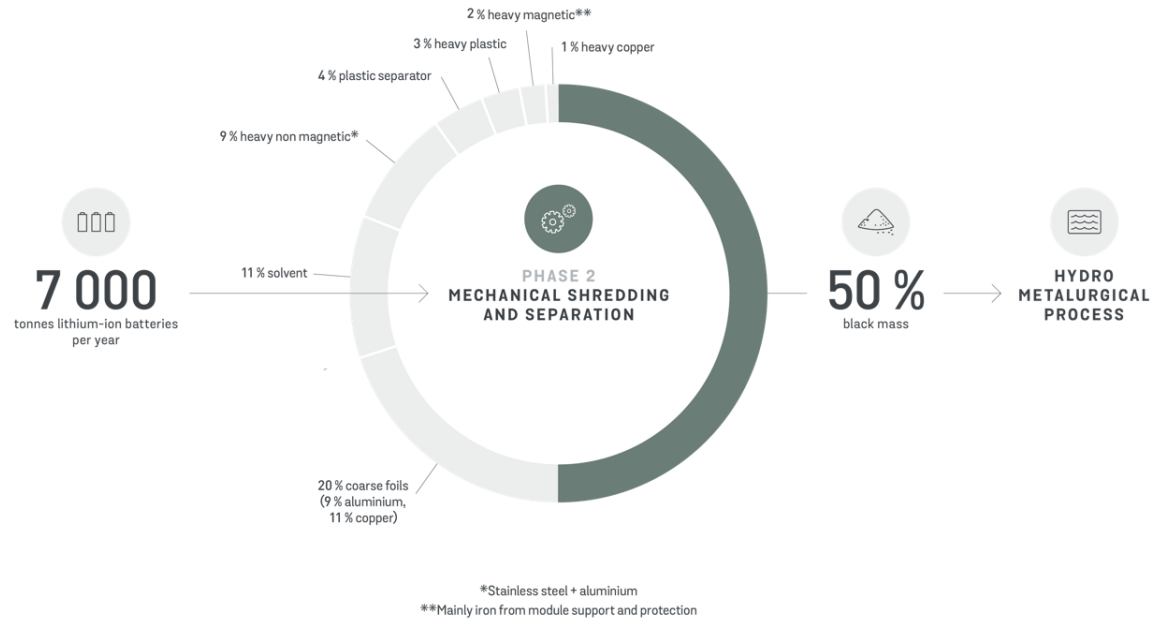
It starts here.

STENA RECYCLING | DK Battery center in Farum



It starts here.

STENA BATTERY RECYCLING CENTER



It starts here.



It starts here.



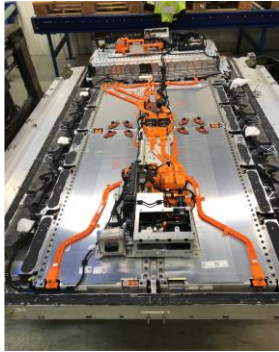
STENA RECYCLING | Battery Recycling Center in Halmstad



It starts here.

STENA RECYCLING VALUE CHAIN

Battery pack



Module



Black-mass



Pre-cursor



Cathode



Cell



RECYCLING

PRODUCTION

It starts here.

A close-up, shallow depth-of-field photograph of a metal grate. The grate consists of a grid of rectangular cells. In the center-left of the frame, one of the cells is replaced by a circular hole. The metal has a dark, slightly weathered appearance. The background is blurred, showing more of the grate's structure.

IT STARTS HERE.

It starts here.

 **STENA**
RECYCLING