



DEVELOPING UK BATTERY RECYCLING INFRASTRUCTURE

PROVIDING RECYCLING OF BATTERIES AND CLOSED LOOP RETURN OF
BATTERY MATERIAL

23RD MARCH 2022

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OUR PURPOSE

A Global leader in
sustainable materials



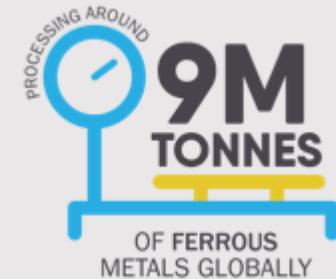
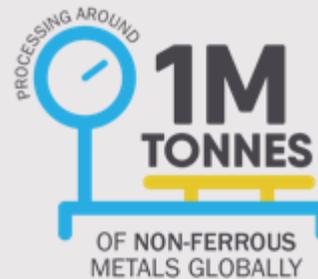


10
MILLION
TONNES

We handle around 10 million tonnes of metals and plastics every year from end-of-life vehicles, consumer products, industry, construction and decommissioning



FAMILY RUN WITH A GLOBAL PRESENCE.



UK

- 60+ sites
- 50 shears
- 9 shredders
- 10 docks
- 1,900+ employees

GERMANY

- 4 sites
- 1 dock
- 99+ employees

NETHERLANDS

- 4 sites
- 3 docks
- 84+ employees

ITALY

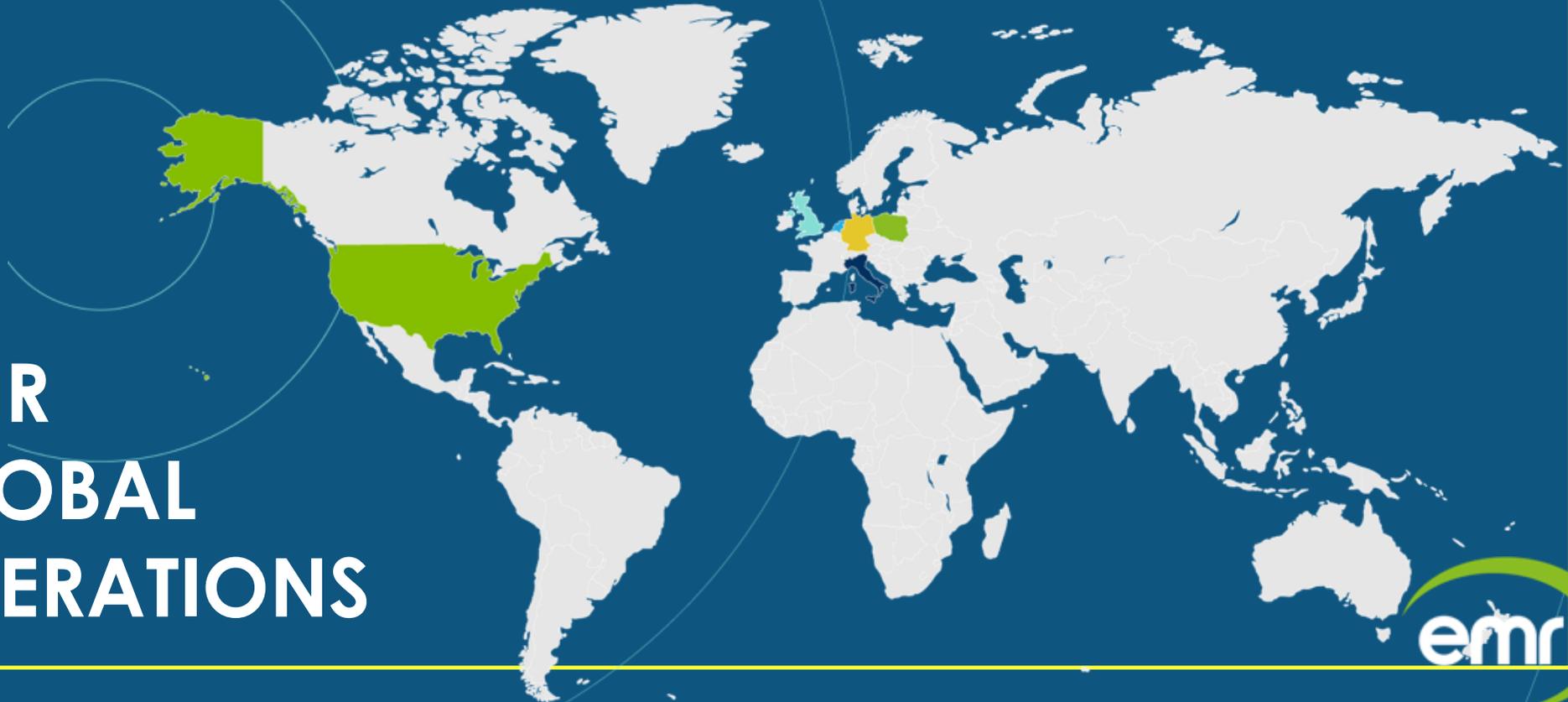
- 1 commercial office

POLAND

- 1 trading office

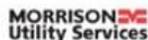
U.S.A.

- 54 sites
- 22 shears
- 3 shredders
- 12 docks
- 1,800+ employees



OUR GLOBAL OPERATIONS





CUSTOMERS WE WORK WITH



NET-ZERO CARBON EMISSIONS BY 2040

Our Net Zero commitment is a 1.5°C Science Based Target across our scopes 1, 2 and 3

We are UNFCCC #RaceToZero Partners



We built our sustainability strategy around four programmes:

- Energy Productivity
- Renewable Electricity
- Movement of People
- Material Handling & Movement



EMR UK ELV position

Largest UK recycler
of end of life
vehicles

Collecting into 50
sites



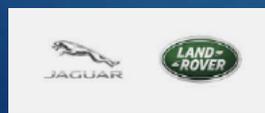
RECOVAS

Recycling of EV Cells from Obsolete Vehicles at Scale



Provided in confidence

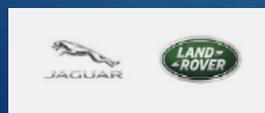
RECOVAS PARTNERS:



Our objective:

To deliver a circular EV battery supply chain for the UK

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- ▶ Responsible for project co-ordination and management
- ▶ Provide safe EV collection, depollution and triage services
- ▶ Complete on site pack dismantling
- ▶ Able to handle large scale recycling of battery packs



Vehicle makers role:

- ▶ Design for disassembly, re-use and recycling
- ▶ Pack-specific rapid triage techniques
- ▶ Life cycle assessment of battery packs and full EVs
- ▶ Supply end of life modules for research and recycling





- ▶ Responsible for developing mobile and fixed triage techniques and equipment for rapid pack evaluation



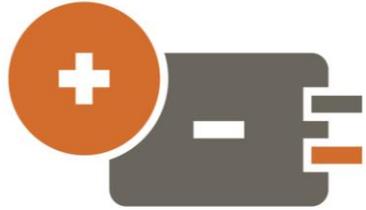
CONNECTED
ENERGY Advanced Energy
Storage Solutions

- ▶ Repurposing EV packs for re-use
- ▶ Supply chain economic evaluation



- ▶ Pack-specific rapid triage techniques
- ▶ Battery recycling scale-up facility
- ▶ Direct Lithium recovery
- ▶ Nickel and cobalt recovery to metal





UK BATTERY
INDUSTRIALISATION
CENTRE

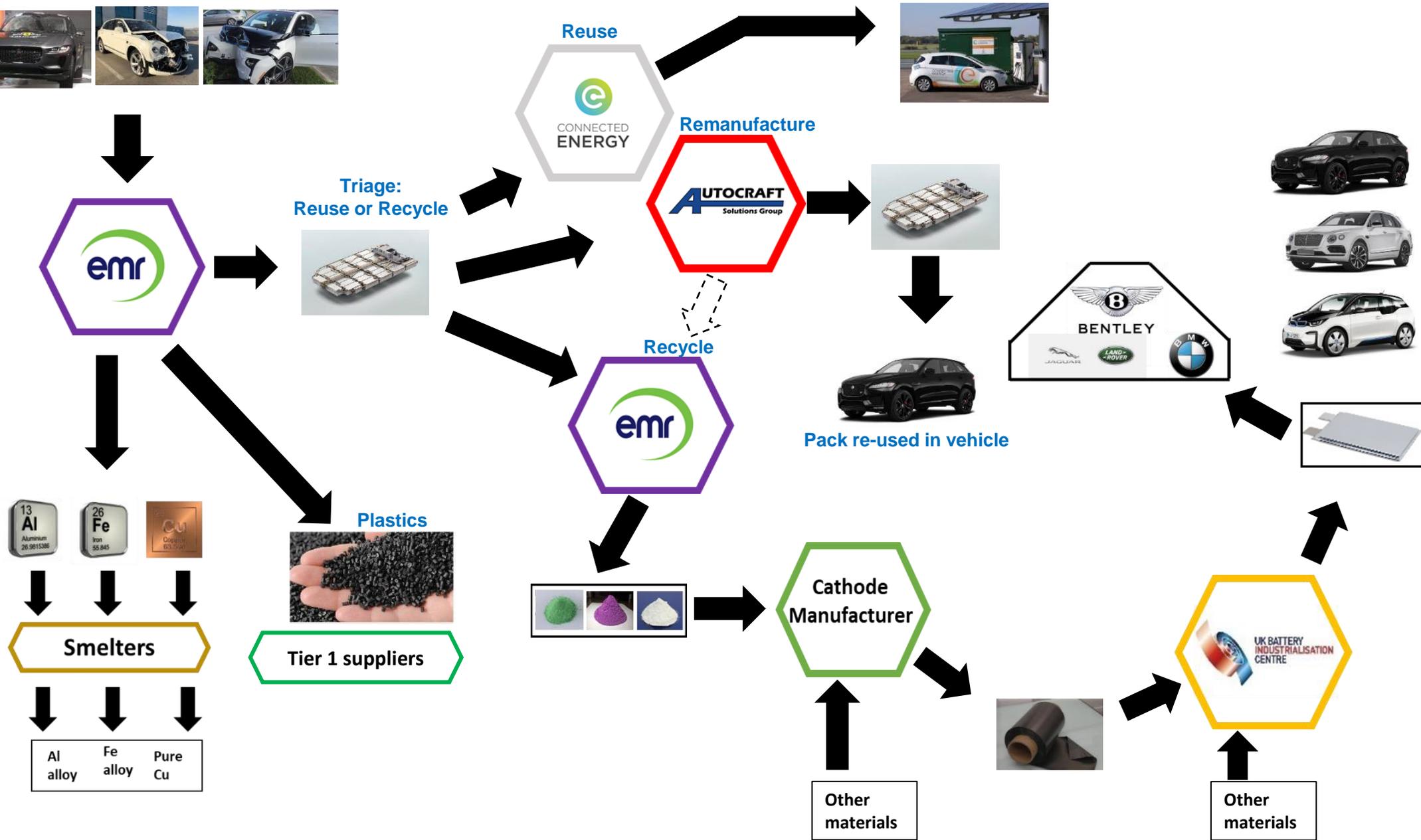
- ▶ Life cycle and economic analysis of the circular battery supply chain

**BESPOKE RESEARCH AND
CONSULTANCY FROM**



- ▶ Safe working procedure guidance for battery pack collection, storage and dismantling





RECOVAS Deliverables

- ▶ Reduce average end of life pack disposal cost for vehicle makers/ last owners to zero
- ▶ Keep critical resources within the UK
 - ▶ Complete packs and modules
 - ▶ Copper, aluminium, cobalt, nickel, graphite and in future, lithium
- ▶ Generate new economic activity and exportable expertise

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EMR demonstrator facility

- ▶ Building a demonstrator facility capable of receiving and depolluting Hybrid and full battery electric vehicles
- ▶ Battery state of health assessment, discharging, and pack disassembly
- ▶ Module shredding and material separation, down to black mass

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ELECTRIC VEHICLE AND BATTERY MANAGEMENT AND FUTURE INVESTMENT

EMR Strategy



- Market leading battery treatment facility to be built in the UK, to handle current production scrap and ELV volumes with closed loop return of materials:
 - wet and dry battery processing
- We are working together with refiners to develop an integrated recycling supply chain for battery materials.
- Together we will provide a **positive value** experience and the all-important **closed loop return** of battery materials
- EMR can offer a total waste management package providing a one stop shop for all waste management

EMR – WHY WE ARE INVESTING IN THIS AREA

- A strong, experienced & credible recycling partner delivering UK and European based recycling solutions
- Long standing, trusted and established relationships with vehicle manufacturers
- A market leading on/near-site recycling capacity to provide **closed loop return** of critical materials – Co, Ni, Li, C, Cu, Al
- Baseload feedstock supply
- Immediate benefit from EMR's Research & Development team and Recovas innovations