

ENGINEERING CIRCULAR ECONOMY

Building closed loop recycling programmes: the challenges and lessons learned

John Redmayne, 5th February 2020

WHO ARE WE?

A global supplier of takeback, consulting and software solutions



LANDBELL GROUP: FACTS AND FIGURES

> €172 m

of sales in 2018 through our take-back, consulting and software solutions

Software deployed in

20

countries

> 380,000

Tonnes of chemicals managed

23 locations in

18

countries

300+

employees worldwide

> 28,000

satisfied customers worldwide

> 10 million tons

of batteries, packaging and WEEE collected and recycled

> €1 m

of investments in the first European circular economy start-up award

> 1000

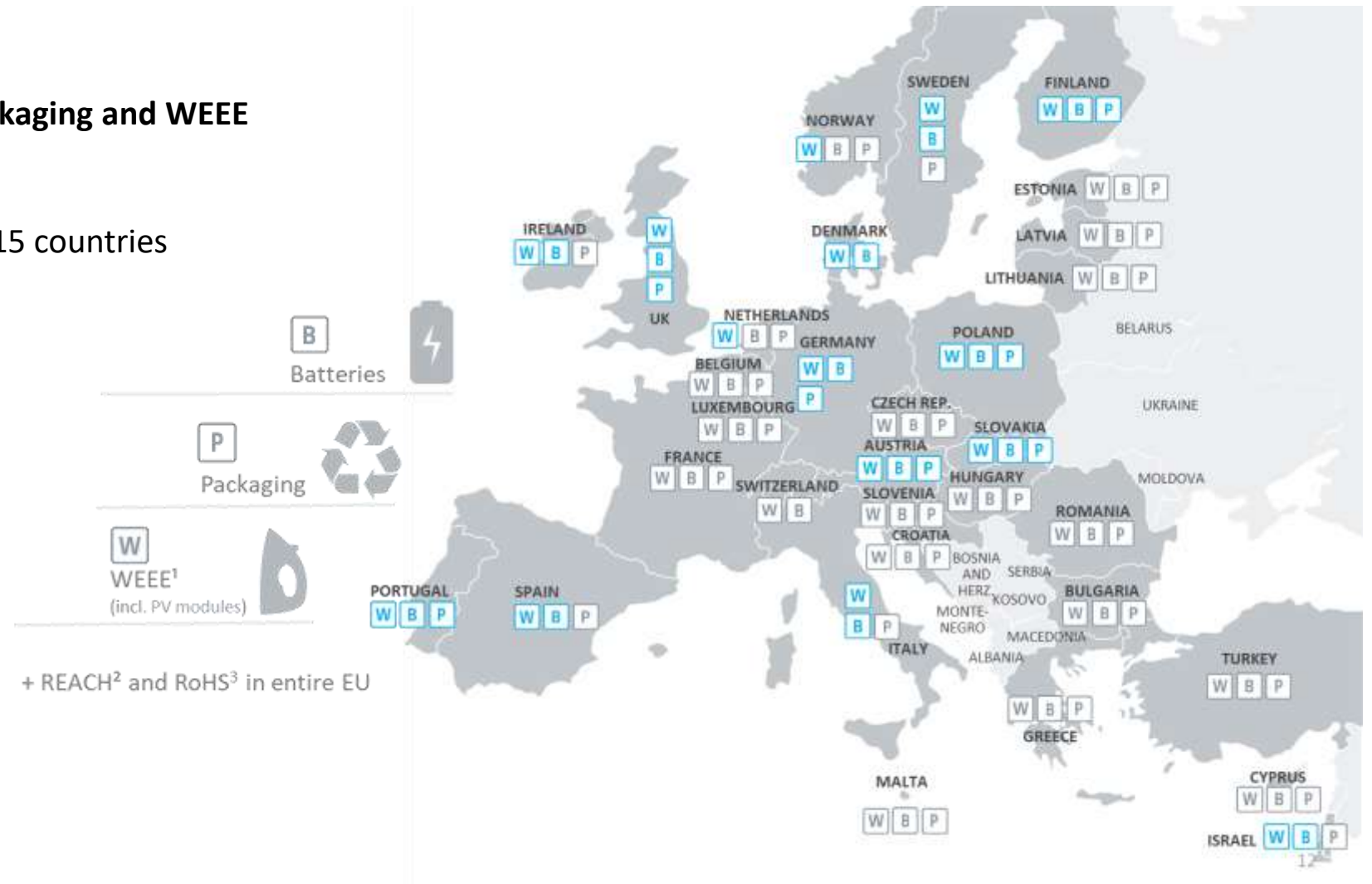
applications for the Green Alley Award from 52 countries

A FEW OF OUR COMPANIES



WHERE WE BEGAN: END-OF-LIFE

- >10 millions tonnes of batteries, packaging and WEEE collected and recycled
- 35 producer compliance schemes in 15 countries
- Mainly in Europe



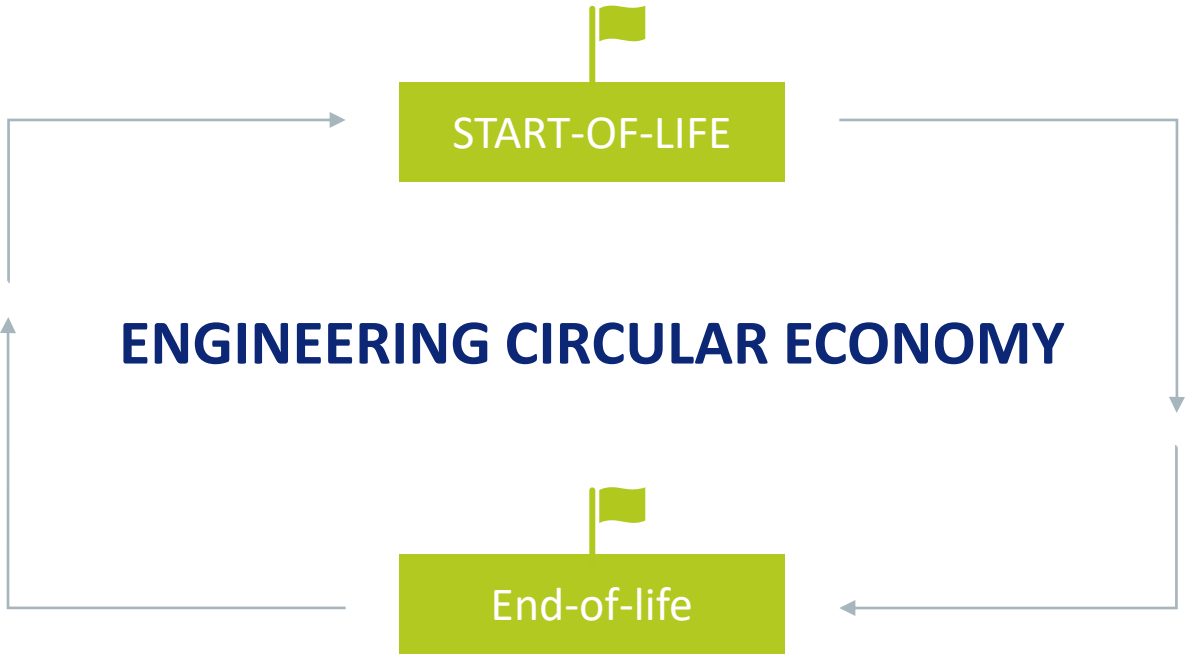
WHERE WE'VE DEVELOPED: START-OF-LIFE

Market entry requirements for Producers and their products

- International chemical compliance in Asia, Australia, Europe and North America
 - REACH, RoHS
- Product Data services
- Extended Producer Responsibility regulatory tracking in over 100 countries
- A truly global approach



WHERE WE'RE HEADING: CIRCULARITY

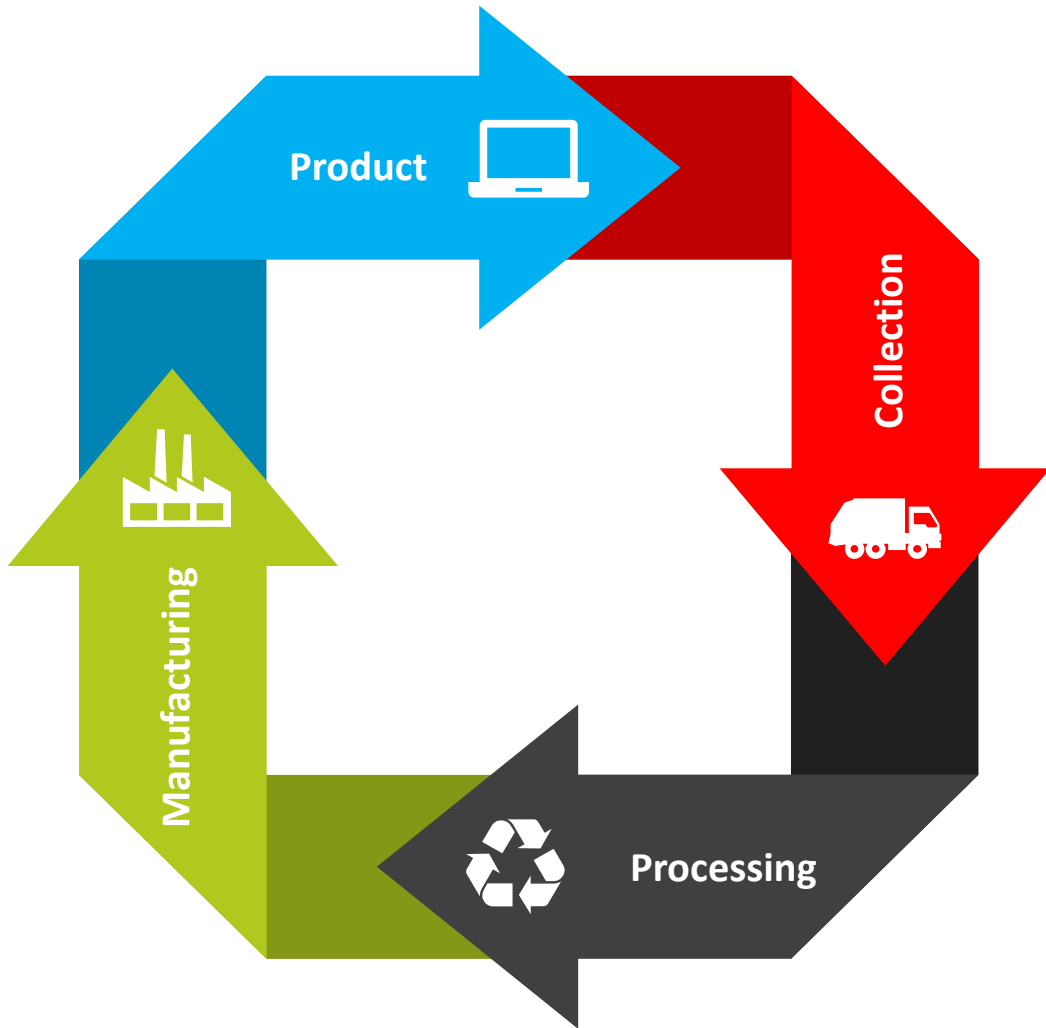


CLOSED LOOP RECYCLING PROGRAMS

The challenges

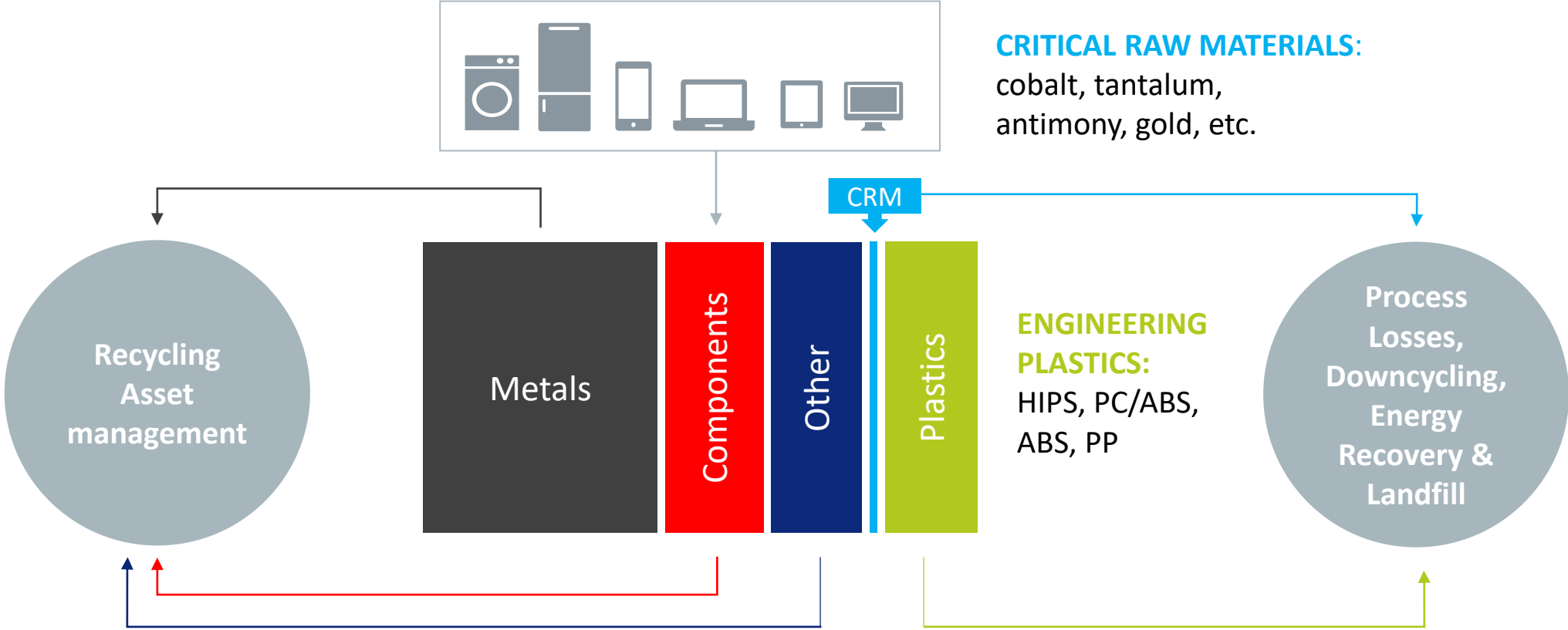


CLOSED-LOOP RECYCLING CONSTRAINTS



- Small and widely dispersed quantities
- Complex cross-border waste regulations
- High logistics costs
- Complex collection supply chain (carriers, collectors, brokers, shipping companies)
- Lack of consistency of sourced material
- Non-global providers
- Lack of knowledge and skills from suppliers
- Fragmented & non-transparent management of downstream fractions
- Restrictions on some contaminants
- Multi-tier treatment processes

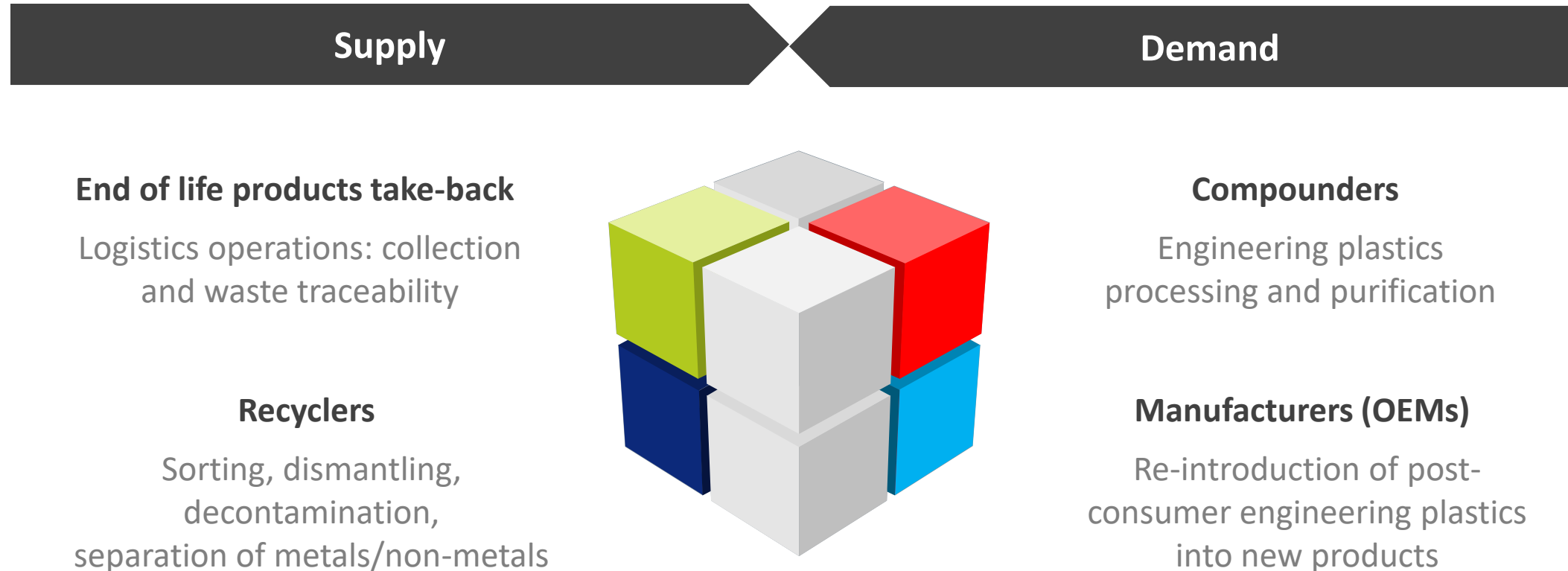
TAKE WASTE ELECTRICAL EQUIPMENT, FOR EXAMPLE



Our focus is developing technological and economical pathways for real closed loop recycling of challenging materials

THE KEY - MATCHING SUPPLY AND DEMAND

Matching the supply of **engineering plastics** with demand from OEMs - the key to successful circular economy projects





DEDICATED/VOLUNTARY TAKEBACK PROGRAMS

The advantages

THE ADVANTAGES

- Taking back manufacturers' own end-of-life products allows for reuse and refurbishment of spare parts, reducing operational and maintenance costs
- Lower levels of material contamination maximizes reuse potential
- Improved service for users, more freedom to optimize reverse logistics routes and service level agreements
- Much easier to implement closed-loop projects – product brand to product brand (we know the specifications of the output fraction and the new products)
- Innovative take-back and remarketing are emerging for many consumer products: producers see them as a way to capitalize on materials' value **and** boost customer engagement

MARKETS WHERE WE DELIVER DEDICATED/VOLUNTARY TAKEBACK PROGRAMMES



Electronics

- Programme started in April 2017
- Tons managed >4500 tons
- >1200 pick-ups managed in the EMEA region
- Types of stream: ICT
- Geographical scope – 23 countries in EMEA (to be extended in 2020 to 39 countries)



E-mobility

- Program started in October 2018
- Tons managed >300 tons
- Types of stream: Li-ion batteries and WEEE (open-scope)
- Geographical scope – 14 countries and >60 cities in EMEA and 4 countries in North (US, Canada and Mexico) and South America (Chile)



Medical devices

- Scope: Feasibility study and pilot testing
- Types of stream: WEEE medical devices (individual auto-injectors and analysers)
- Geographical scope – 5 countries in EMEA

THE NEXT LEVEL ...

In 2019, global sales of new electric vehicles (EVs) passed a million units.

How do we improve the circularity of this hugely strategic sector?

Can we shift the focus from recycling to reusing Li-Ion batteries?



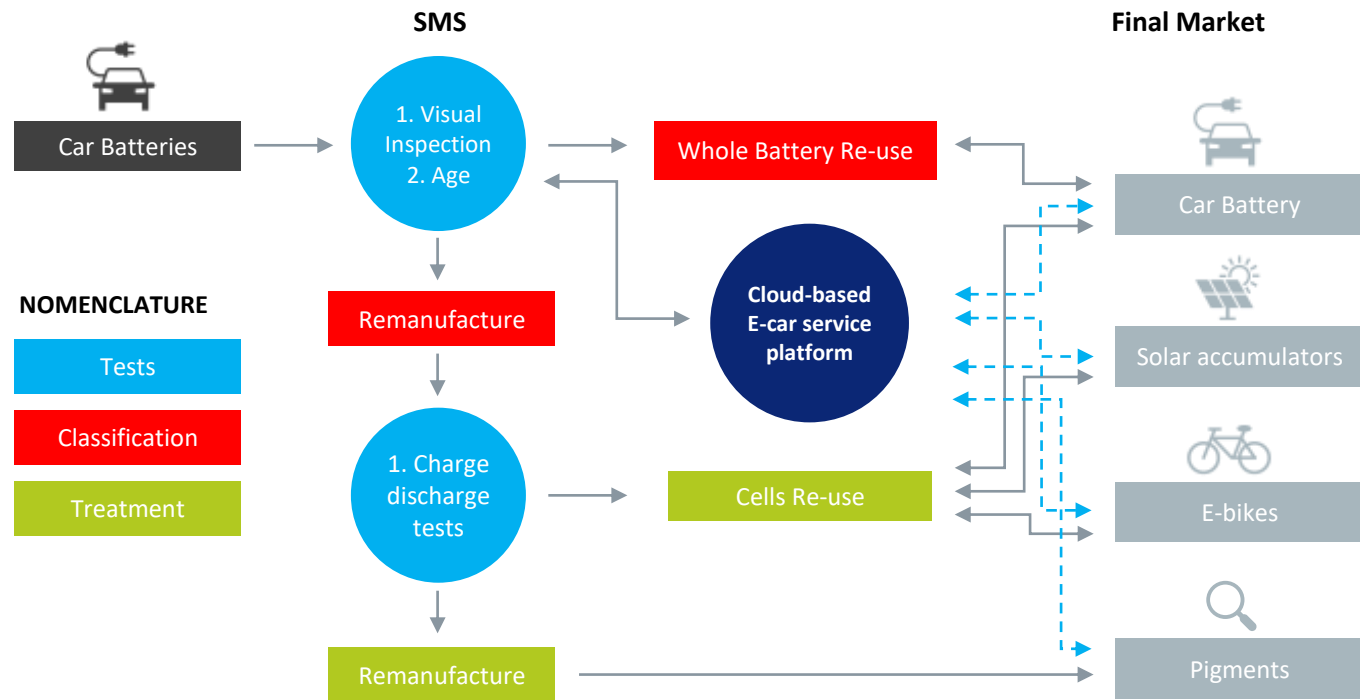
CarE-SERVICE

- Landbell Group is one of the partners on the CarE-Service project, which will develop innovative business models to boost the reuse, remanufacturing and refurbishing of the high-value parts and components that are used in EVs and HEVs, namely the metals, batteries and techno-polymers
- This will help to reduce the current high cost of EVs and HEVs, transform their end-of-life management, and improve user experience



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776851

DEVELOPING RE-USE TECHNOLOGIES

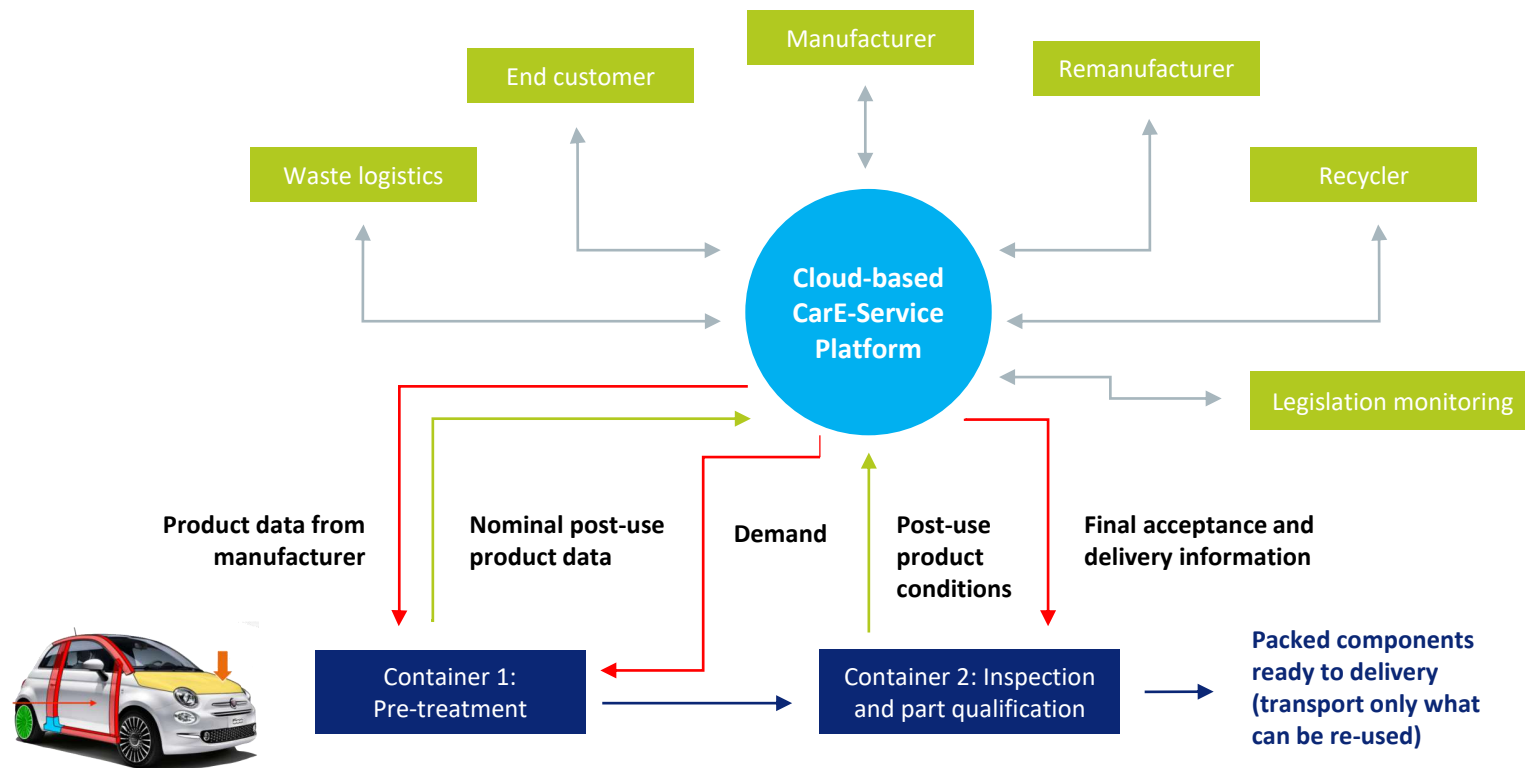


Techno-polymers



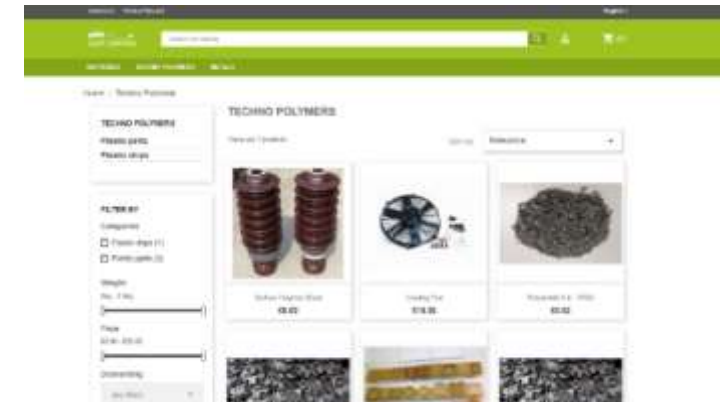
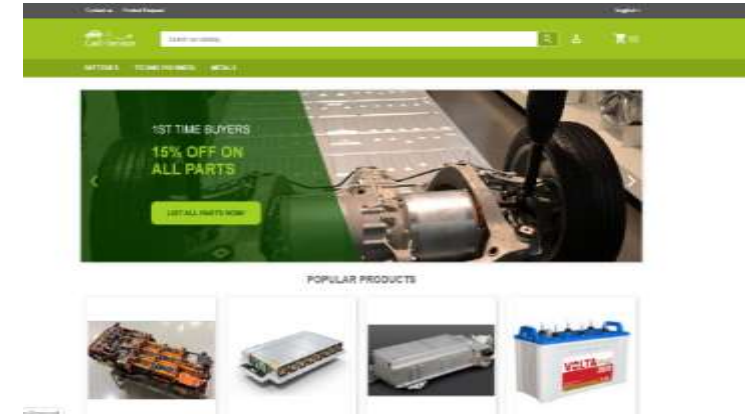
BRINGING IT ALL TOGETHER: THE CarE-SERVICE ICT PLATFORM

- Landbell Group will develop the ICT Platform which will connect demand and supply of re-usable parts and coordinate and optimize the re-use value chain



ONLINE MARKETPLACE AND REVERSE LOGISTICS PLATFORM

- ICT platform will consist of:
 - an online marketplace for trading the metals, batteries and techno-polymers
 - reverse logistics platform for managing their take-back
- It can manage more than:
 - 40,000 collection points
 - 600 operators
 - 5 Gb of evidence per month
 - 40,000 logistics operations per month
- Landbell Group's environmental software is already deployed in 20 countries, across 4 continents, and manages eight million tonnes of waste and €2.7B of revenue



ENGINEERING CIRCULAR ECONOMY

Conclusions



THE OPPORTUNITIES



New Capabilities

- ✓ Exciting opportunity to develop more products/services with partners and customers
- ✓ Opportunity-driven take-back
- ✓ Continuous customer engagement



New Business Models

- ✓ Sharing economy
- ✓ Product as a service
- ✓ Product life-cycle extension



New or Adapted Technologies

- ✓ New products, design and materials
- ✓ IT
- ✓ Technology for EoL recycling and recovery



The Right Partners

- ✓ Downstream and upstream
- ✓ Sharing costs, benefits and successes

SUCCESS FACTORS



Digitalisation /IT tools

Robust, real time
digital
infrastructure



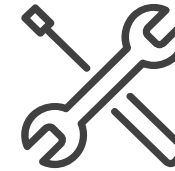
Established Supply Chain

Extensive and
highly developed
physical
infrastructure



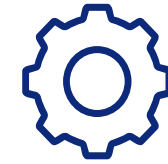
Technical Knowledge

Expertise and
experience of
materials and output
fractions



Market Expertise

Knowledge of waste
and commodities
markets - locally and
globally



Proven Processes

Tried and tested
global reverse
logistics
processes

ENGINEERING CIRCULAR ECONOMY



John Redmayne

Managing Director – ERP UK

European Recycling Platform

ERP UK Ltd | Barley Mow Centre | 10 Barley Mow Passage | London
W4 4PH | UK

Phone: +44 203 142 6452 | Mobile: +44 7930 385 751

Email: john.redmayne@erp-recycling.org

Site: www.erp-recycling.org/uk