

How efficient is 'end of life take back' for Industrial Ni-Cd batteries?

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THE CHALLENGE

The challenge is to compare:

(A): The quantity of waste industrial Ni-Cd batteries *collected* from the EU in a given year

With:

(B): The quantity of waste industrial Ni-Cd batteries that are *available for collection* in that same year

(A): QUANTITY COLLECTED IN THE EU IN A GIVEN YEAR

Statistics can be generated by aggregating anonymous recycling data (for waste batteries collected in the EU) from Ni-Cd recyclers

ICdA (International Cadmium Association) has been collecting and aggregating **recycling** data from Ni-Cd recyclers on batteries returned from end users located in EU-28 (+NO+CH+LI)

Two categories are being tracked:

- “Industrials”
- “Portables”.

Recyclers classify according to mechanical structure:

- **Rectangular** batteries are “Industrial” always true
- **Round** (sealed) batteries are “Portable” sometimes false

At this time, these entities are unable (no methodology has been developed) to separate “sealed portables” from “sealed industrials”.

Consequence: Scope of Study will be **rectangular** Ni-Cd batteries only.



(B) QUANTITY AVAILABLE FOR COLLECTION IN THE EU IN THAT SAME YEAR

α /. Define segments and estimate typical use life:

- Define segments,
- Define typical use life

β /. Go back in time, develop battery sales in weight (not in value)

- Sales software does not always keep track of weight properly – a lot of cleanup to do
- Generate shipping volumes based on **“Ship to address” in the EU** for the proper year of each segment

γ /. Account for re-exports outside the of the EU:

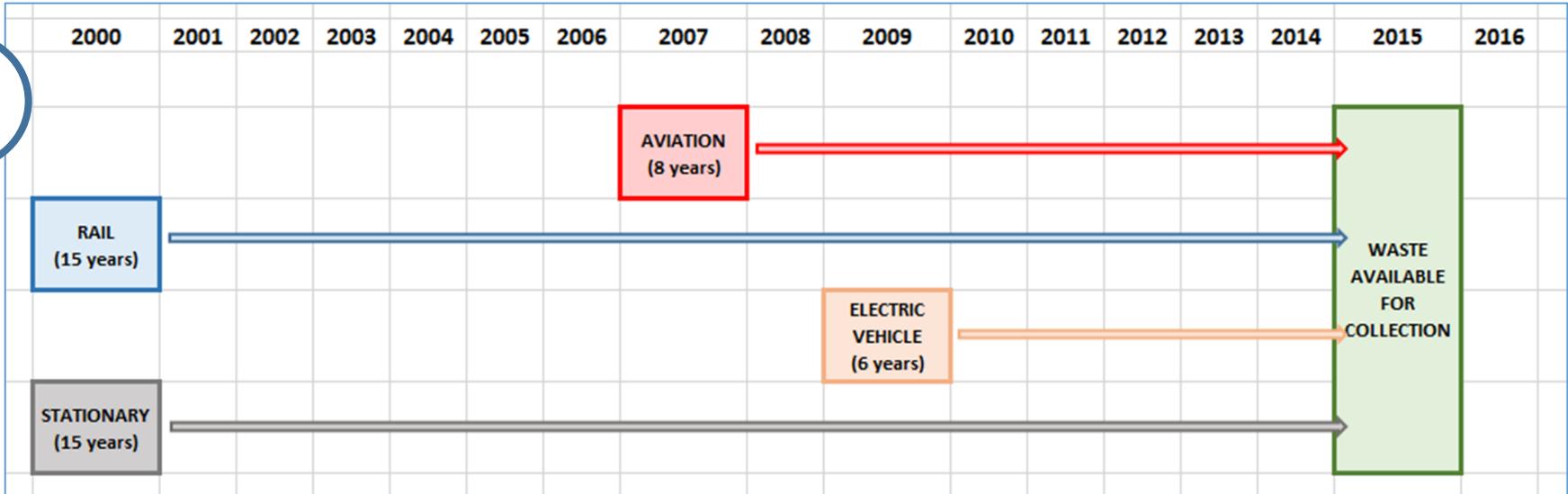
- Classify each major customer by role: End User, Distributor, OEM, EPC
- For each “Non End-User”, estimate and exclude the “re-exported” fraction
- Aggregate data

δ /. Take market share into consideration:

- Estimate market share of main player and adjust accordingly

α. DEFINE SEGMENTS – ESTIMATE USE LIFE
β. GO BACK IN TIME – DEVELOP BATTERY WEIGHT

α.



β.

	A	B	C	D	E	F	G	H
	Country ISC	Country	QTY	Product	Unit Weight	Extended Weigh	Weight UM	Price per kg
1	FR	FRANCE	2	BTR SAB-140E	1285	2570 KG		45
3	FR	FRANCE	31	BTR SPP-100M	0	0 KG		39
4	FR	FRANCE	380	ELM SGP-1000ME	5	1900 KG		38
5	FI	FINLAND	6	BTR SAB- 250M	202	1212	U	0
6	DE	GERMANY	132	ELM SBB-1500 EQ	8	1056 KG		43
7	AU	AUSTRIA	18	BTR SMR-850 NG	125	2250 KG		138

γ. ACCOUNT FOR RE-EXPORTS OUTSIDE OF THE EU
δ. TAKE MARKET SHARE INTO CONSIDERATION

γ.

RAIL			
CUSTOMERS WITH "EU SHIP TO "ADDRESS	WEIGHT	% EXPORTED	WEIGHT STAYING IN THE EU
SNCF DEPOT DE ROMILLY	120	0%	120
BOMBARDIER TRANSPORT PROJECT X44	45	60%	18
REGIE DES TRANSPORTS DE LYON	25	0%	25
RATP PARIS	97	0%	97
S-BAHN BERLIN	12	0%	12
KÖLN TRANSPORT	33	0%	33
SIEMENS TRANSPORT	90	40%	54
ALSTOM FERRO	160	80%	32
TOTAL	582		391

δ.

$$\frac{\text{Volume of Player One}}{\text{Market Share of player One}} = \text{Market Volume}$$

CONCLUSIONS AND COMMENTS

<i>indexed data</i>	2014	2015	2016
AREA: EU			
AVAILABLE FOR COLLECTION	100	100	
RECYCLED (source ICdA)	145	140	
Collection efficiency	145%	140%	

Immediate observation:

- 'Available for Collection' and 'Recycled' in the very same range
- Collection Efficiency >100% is reassuring, even if it is obviously somewhat overestimated

Tonnage "Recycled" is:

- Reliable but could be marginally underestimated

Tonnage "Available for Collection" can be refined:

- **Waste age:** for each segment, consider using an age distribution, rather than a single age for the whole segment
- **% re-exported outside of EU** (for non-end customers): to be reviewed
- **Market share:** should be assessed by segment, for the years considered