The TARGETED RISK ASSESSMENT REPORT on the use of cadmium in nickel-cadmium batteries.

The TRAR gives an analysis of the environmental impact of the production, use and end of life management of portable/sealed nickel-cadmium batteries. It analyses the impact to the environment of industrial nickel-cadmium batteries at the production stage. The draft TRAR examines various scenarios related to the sales of portable/sealed nickel-cadmium batteries and evaluate the impact of the efficiency of various collection and recycling programmes.

The human health aspect related to the impact of cadmium emissions from nickel-cadmium batteries has been analysed in the context of the general file "Risk Assessment Report on Cadmium and Cadmium oxide" performed in accordance with Council Regulation (EEC) 793/93[1] on the evaluation and control of the risks of "existing" substances.

The EU's scientific experts (the CSTEE[1]) have issued their opinion on the EU Risk Assessment for Cadmium and the Targeted Risk Assessment Report (TRAR) on the use of cadmium in nickel-cadmium rechargeable batteries in June 2004.

The CSTEE opinion

- states that "the contribution of cadmium exposure from sources other than nickel-cadmium batteries represents the main component in the overall exposure level for most estimations".
- describes the contribution of nickel-cadmium batteries to the overall exposure of cadmium to the environment as 'negligible'.
- further states that 90 to 100% of cadmium in the environment is related to other sources.

[1] The CSTEE, the Scientific Committee for Toxicology, Eco-toxicology and Environment is an independent scientific body requested by the Commission to produce opinions on the risk assessment reports conducted in the context of council regulation 793/93 (existing substances regulation).

The Charts presented below are illustrating these statements from the CSTEE.

The risk assessment itself confirms that the contribution of cadmium from nickel-cadmium batteries is generally less than 1% of the total input of cadmium to the environment.

These conclusions indicate that any reductions in use of nickel-cadmium batteries would not have any significant effect on the overall inputs of cadmium to the environment.

The battery industry is fully supportive of the use of regulation to stimulate collection and recycling of nickel cadmium batteries and is committed to building on recent trends in raising collection and recycling rates. This reflects a commitment to efficient use of resources and minimization of waste in line with principles of sustainable development.

Industry is strongly encouraging the EU Council and EU Parliament to take into account the findings of the TRAR as previously considered by the Commission in the draft Battery Directive proposal of November 2003.

In line with the EU Inter-Institutional Agreement on Better Law Making, the TRAR constitutes an important basis on which good legislation should be prepared particularly for products containing classified substances.

This long awaited TRAR, which has already been endorsed by the 15 Member States technical experts, is a vital tool for decision makers in the ongoing debate on the proposed new EU Battery Directive.

The way the TRAR will be considered will indicate how the new EU Council and Parliament intend to deal with waste management issues.

Remarks on the content of the TRAR.

General comments

1. The Targeted Risk Assessment mention that **industrial** Ni-Cd batteries are collected and recycled with a high rate and are not representing a significant source of Cd emissions to the environment at end of life (p66 – Draft February 17, 2003).
2. The Collection rate is a key issue in the collection of spent **sealed/portable** Ni-Cd batteries from their various applications.
3. Sorting batteries from other batteries waste streams and from MSW is a key issue in achieving high collection rates for sealed/portable Ni-Cd batteries.

Built-in levels of conservatism in the TRAR

1. Ni-Cd batteries will be collected with WEEE. This is not considered by the TRAR and leads to a level of built-in conservatism in the worst case estimations.
2. Scenarios with dilution factors of 20 for water emissions are considered without analysing the general content of effluents concentrations. The TRAR considers Cadmium as a single element while an aqueous effluent from an Incinerator or a landfill has a complex composition. Dilution factor of 20 leads to pollutants concentration that make the release of the effluent illegal independently of the cadmium concentration! This is adopted as the worse case scenario by The Rapporteur.
3. The sediment issue will be fully revised at the light of cadmium bio-availability data obtained in the frame of the conclusion i) on cadmium bio-availability in sediments funded by the cadmium and nickel-cadmium battery industry.
4. The TRAR does not analyse the emissions of cadmium present in Fly Ash from MSW Incinerators and stored after stabilisation in hazardous waste landfills. It does not analyse emissions from bottom ashes used in road construction after passing successfully a leaching test for classification as non-hazardous waste.

Consideration of alternatives

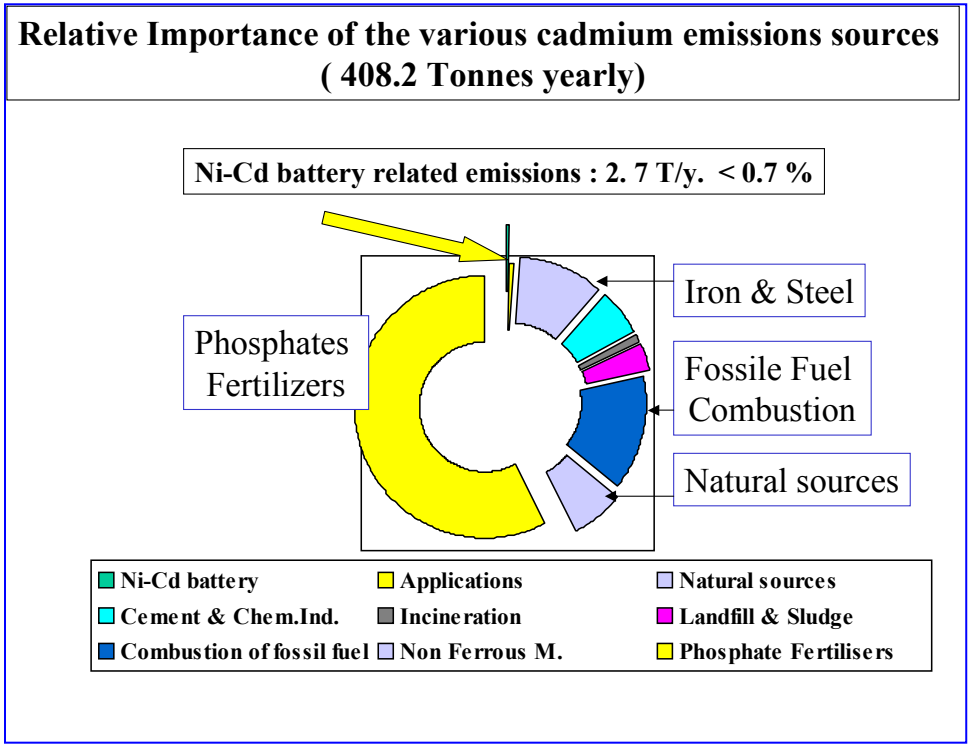
1. The TRAR does not analyse the scenario where cadmium sponge is landfilled as hazardous waste instead to be used in nickel-cadmium batteries.

N.B. In the charts below, we have detailed the sources of cadmium emissions at the stages of manufacturing, recycling and waste management as proposed in the TRAR.

CHART 1. Total Cadmium emissions to the environment.

From a total of 408 Tonnes/y. of cadmium emissions, 231 Tonnes/y. are introduced via phosphates fertilisers while another 54.1 Tonnes/y. by the fossil fuel combustion , and another 46.6 Tonnes/y. are emitted by the iron and steel industry. Emissions of cadmium from spent batteries present in landfills and/or treated by incineration with Municipal Solid Waste represents between 20 to 50 % of a total of 4.6 Tonnes or between 0.9 to 2.7 Tonnes per year. This quantity represents less than 0.7 % of total cadmium emissions as illustrated in Chart 1. In Annex 1, the Table is detailing all numbers used to prepare Chart1 to 4, below.

CHART 1.



It is important to consider than in addition to the anthropogenic sources, the natural sources of cadmium emissions represents approximately 40 Tonnes per year or 10 of total anthropogenic sources.

CHART 2. Cadmium deposition onto soil.

The Chart 2 represents the major sources of cadmium deposition onto soil. This Chart is critical as it indicates the routes by which humans are exposed to cadmium (food chain) mainly through fertilizers (diffuse source at European scale via the food chain) and through other anthropogenic and industrial sources not related to batteries (Sewage Treatment Plants). The contribution of batteries to the exposure of humans to cadmium represents less than 0.2 % of total soil deposition.

CHART 2

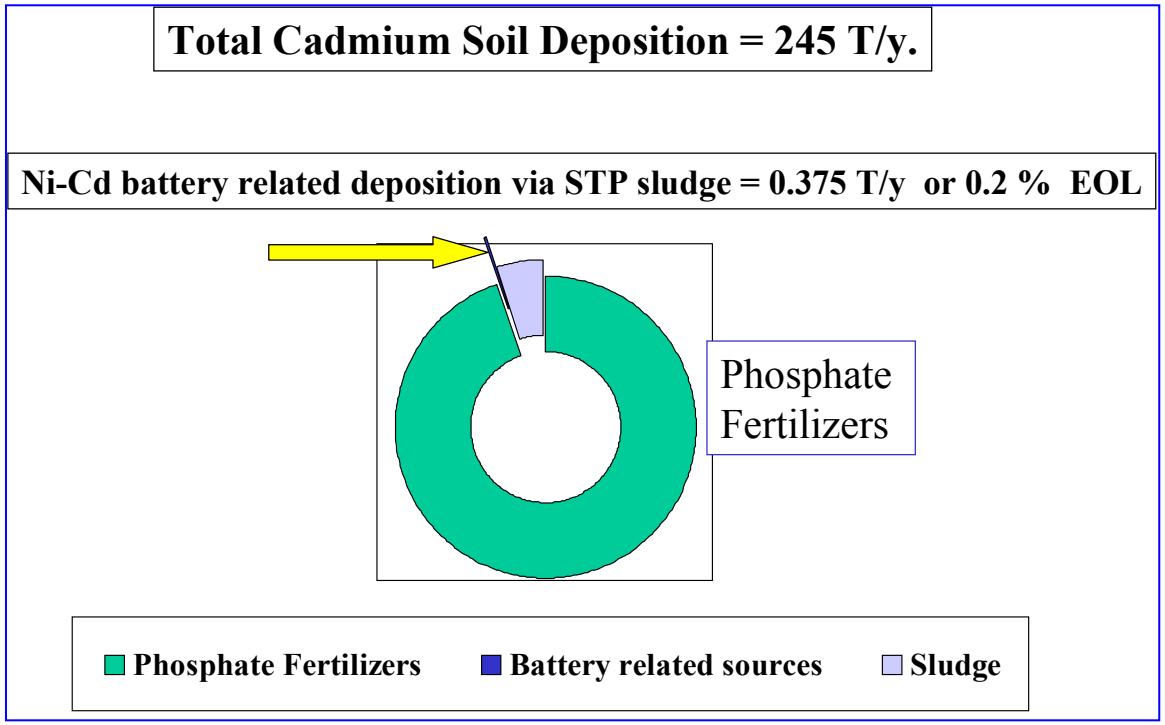


CHART 3. Cadmium emissions to water.

In the next chart the fraction of cadmium emissions to water is illustrated. Batteries are only a minor contributor estimated to less than 0.6 Tonnes/y. or 1.5 % of total emissions to water.

CHART 3

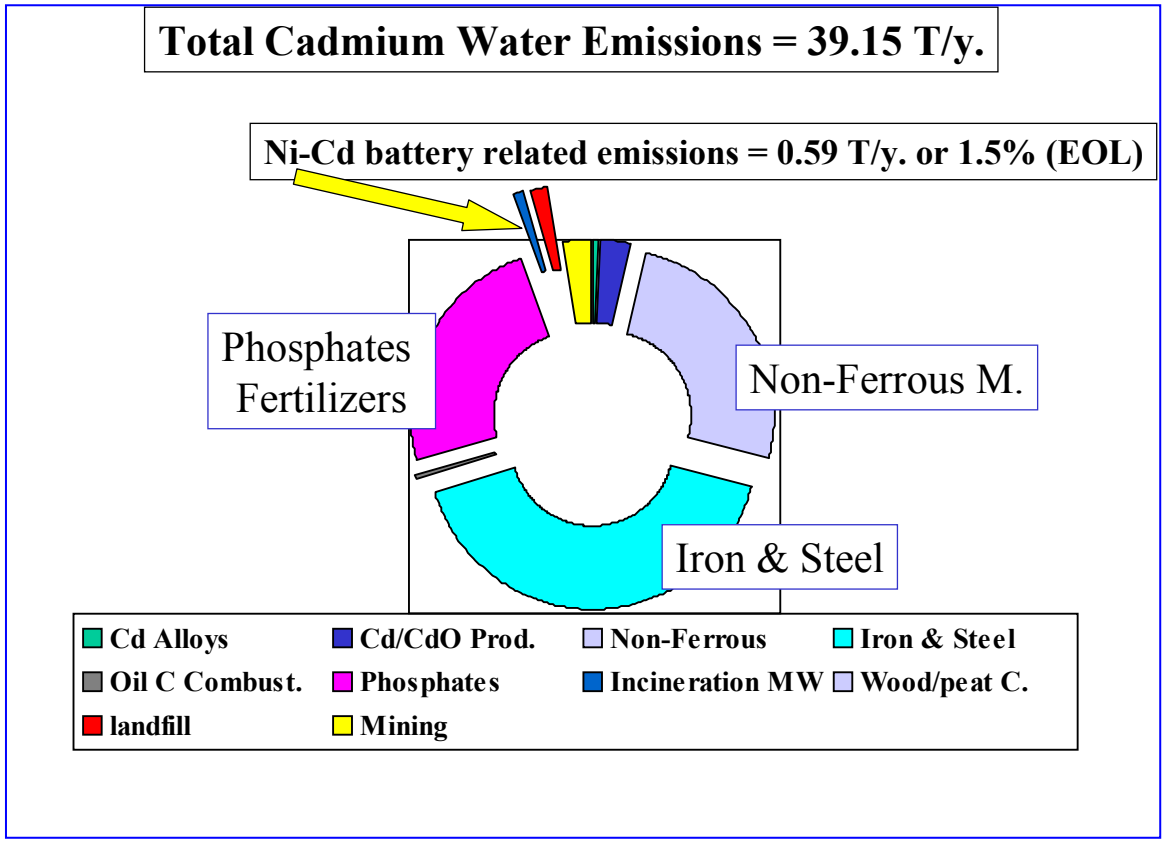
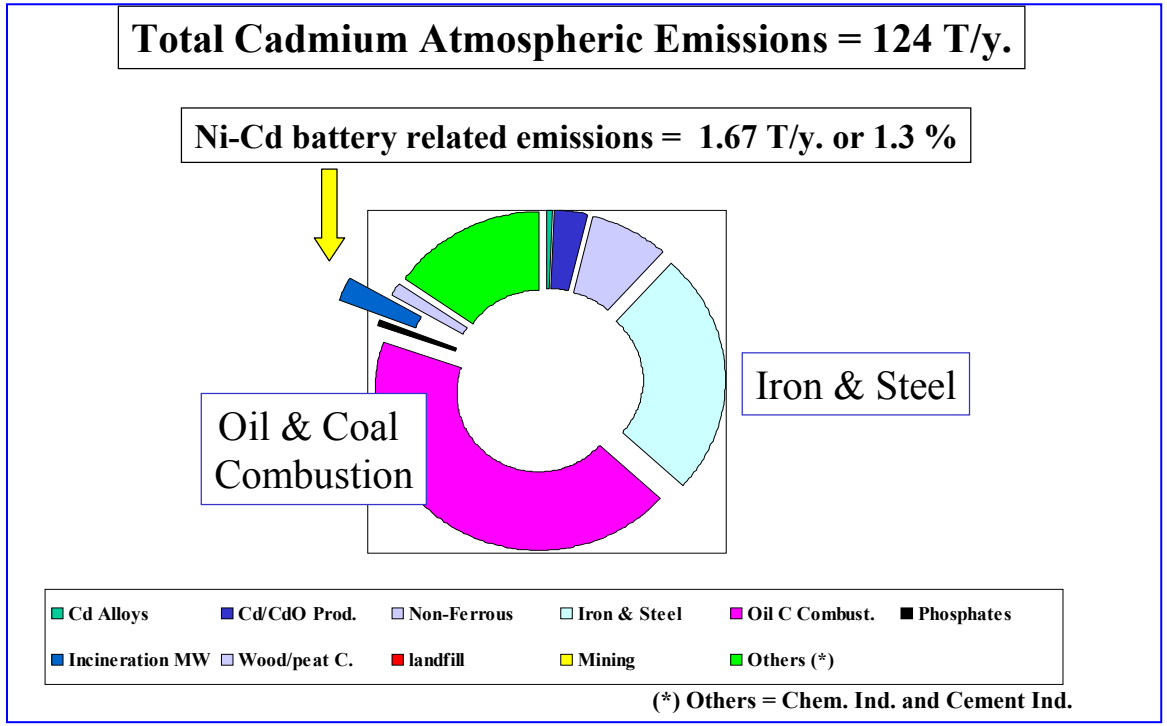


CHART 4. Cadmium emissions to atmosphere

In Chart 4 the atmospheric emission sources of cadmium are illustrated. Batteries are only a minor contributor in percentage of total emissions and are estimated to emit less than 1.7 Tonnes per year or 1.3 % of total emissions to atmosphere.

CHART 4



5. Conclusions.

Beyond the fact that specific risk reduction measures will always apply at local scale if a production centre or a waste management unit has emissions that are above a risk limit, the Risk Management phase will concentrate on the reduction of cadmium emissions from the following sources.

1. Diffuse sources: phosphate fertilizers.
2. Point sources (not related to battery at EOL).

2.1. water emissions - Non-ferrous metals + Iron & steel + Phosphate fertilisers+ CdO production..

2.2. atmospheric emissions – Iron and steel & Non-ferrous metals & Oil & Coal.

3. Point sources battery related: one recycling plant (Ni-Cd batteries), incineration plants and landfills leachates production.

Annex 1. Summary Table with all anthropogenic sources of cadmium emissions to the environment (not including natural sources).

Cadmium emissions in EU : sources of cadmium in Tonnes / year. Source : Final Draft TRAR May 2003.

Tonnes / y.	Cd Alloys	Cd Plating	Ni-Cd prod.	Cd/CdO	NF Met.	Iron & Steel	Fossil Fuel Combustion	Phosphates	MSW Inc.	Landfilling	Mining	Chem.Ind.	Wood/Peat Comb.	Cement/ Glass/Trafic	Munic. STP Sludge	Total T/y.
Water Air Soil	0.82	0.2	0.07 0.053	1.2 3.9	9.7 9.7	15.6 31	0.1 54	9.1 0.7 231	0.35 3.2	0.55 0.3	1.1	1.2	1.7	19	13.6	39.17 124.073 244.9
Total	0.82	0.2	0.123	5.1	19.4	46.6	54.1	240.8	3.55	0.85	1.1	1.2	1.7	19	13.6	408.143
Batteries Contribution				C 1												
Cd/CdO Production				1.9												1.9
EOL	0	0	0.123		0	0	0	0	1.8	0.3	0	0	0	0	0	2.223
Applications T/y.	0	0	0.123	1.9	0	0	0	0	1.8	0.3	0	0	0	0	0	4.1

C1 : Cd/CdO : EU batteries contribution = 75 % of total and 50 % export rate.