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Options in European legislation to reduce water pollution in the Netherlands: cadmium as case study

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Abstract

European legislation to combat water pollution in the Netherlands: cadmium as case study

The RIVM has performed a study on European legislation useful for reducing cadmium pollution in Dutch surface waters. The Integrated Pollution Prevention Control Directive (IPPC) is an instrument that can impose restraints on one of the main sources of pollution, the industrial sector. However, for certain categories of industry the IPPC is limited to installations exceeding specific capacity thresholds. At the moment, it is not clear if the existing legislation is sufficient to combat other main cadmium contributors, such as agriculture or deposition from the air. The RIVM recommends studying the extent of the present legislation in more detail.

The European Water Framework Directive requires all Member States to completely eliminate the discharge of a number of hazardous pollutants (the so-called zero emission of priority hazardous substances), of which cadmium is one. However, the Water Framework Directive does not concretely prescribe how to reduce emissions. For cadmium, the main sources of pollution were identified and the potentially applicable legislation was mapped. In the Netherlands, cadmium quality standards are exceeded only in international rivers, with industry as the major source of pollution.

Key words:

cadmium, measures, emission, Community legislation, heavy metals

Rapport in het kort

Europese wetgeving en de bestrijding van vervuild oppervlaktewater in Nederland: cadmium als case study.

Het RIVM heeft uitgezocht met welke Europese wetgeving de vervuiling van oppervlaktewater met cadmium in Nederland kan worden teruggedrongen. De richtlijn Integrated Pollution Prevention Control (IPPC) kan één van de voornaamste vervuilers, de industrie, aan banden leggen. De IPPC-richtlijn bestrijkt overigens niet de gehele industrie. Het beperkt de uitstoot van installaties met een grote productiecapaciteit. Voor bepaalde categorieën industrie, vallen installaties met een kleinere capaciteit buiten het bereik van deze richtlijn. Momenteel is nog niet duidelijk of de bestaande wetten het oppervlaktewater voldoende beschermen tegen vervuiling met cadmium door andere grote bronnen, zoals de landbouw. Het RIVM adviseert dit nader uit te zoeken.

De Europese wet Kaderrichtlijn water verplicht alle lidstaten van de Europese Unie de uitstoot van een aantal gevaarlijke stoffen zoals cadmium volledig terug te brengen (de zogeheten nulemissie). De wet bevat echter geen concrete voorschriften hoe de vervuiling terug gedrongen moet worden. Daarom is in kaart gebracht wat de belangrijkste vervuilende bronnen zijn en welke wetgeving daarvoor kan worden ingezet. Voor de grote Nederlandse rivieren komt de vervuiling vooral uit het buitenland, met de industrie als belangrijkste bron.

Trefwoorden:

cadmium, maatregelen, emissie, Europese wetgeving, zware metalen

Contents

Summary	6
1 Introduction	7
2 Methods	9
3 Results	11
3.1 Water Framework Directive 2000/60/EC and daughter directives 2455/2001/EC, draft proposal EQS and 2006/11/EC	12
3.2 Dangerous Substances Directive (76/464/EEC) and daughter Cadmium directive (83/513/EEC)	13
3.3 Drinking Water Directive 98/83/EC	14
3.4 Marketing and Use Directive 76/769/EEC and amendments 91/338/EEC and 1999/51/EC	15
3.5 REACH Regulation (EC) No 1907/2006	19
3.6 Existing Substances Directive 793/93/EEC	19
3.7 IPPC 96/61/EC, 166/2006/EC cq. E-PRTR and 2000/479/EC cq. EPER	20
3.8 Council Directive 75/442/EEC on waste and re directive 2000/76/EC on incineration of waste	21
3.9 Directive 96/62/EC on ambient air and re directive 2004/107/EC on cadmium	21
3.10 Protocol on Heavy Metals of UNECE Convention on long-range transboundary air pollution	22
3.11 The packaging and packaging waste Directive (i.e. Directive 94/62/EC, Commission Decisions 1999/177/EC and 2001/171/EC	22
3.12 Directive 86/278/EEC on sewage sludge	23
3.13 Directive 2000/53/EC on 'End of Life Vehicles'	24
3.14 Directives EEE (2002/95/EC), WEEE (2000/96/EC) and amendments 2005/747/EC, 2005/618/EC and 2006/691/EC	25
3.15 Regulations 466/2001/EC and 1881/2006/EC on contaminants in foodstuffs	25
3.16 Directives 2002/32/EC and amendment 2005/87/EC on undesirable substances in animal feed	27
3.17 Regulation (EC) No 1013/2006 on shipments of waste	28
3.18 Council Resolution on a Community action programme to combat environmental pollution by cadmium	29
4 Discussion	31
References	37
Appendix I Legislation relevant for the emission control of cadmium which is in force	39

Summary

The Water Framework Directive and its draft daughter Directive for Environmental Quality Standards require Member States to establish risk reduction measures to protect the aquatic environment from pollution of Priority Substances and from hazardous non-priority substances. The Water Framework Directive refers to specific directives and regulations with different aims, but also to 'other relevant Community legislation' in several articles. The aim of the study described in this report was to overview all European legislation that could be used in developing risk reduction measures for emission control using cadmium, a Priority Hazardous Substance under the Water Framework Directive, as case study.

The search for European legislation started in Eur-Lex ('The access to European Union law'). Additionally consulted sources included the draft Risk Assessment Report and the draft Risk Reduction Strategy. The search resulted in a dataset of 282 documents of which 117 are both relevant and in force.

Legislation was considered relevant if the words 'cadmium' or 'heavy metal(s)' were mentioned in the text or annexes. Another factor for determining relevancy was the presence of cadmium in the environment or in products, or the exposure of humans to cadmium. Information on type and extent of the pollution sources is needed to estimate the potential of legislation to reduce environmental pollution. By comparing pollution sources with the available legislation, a selection can be made of legislation potentially effective for reducing emissions to the environment.

Pollution of surface waters by cadmium in the Netherlands was not studied in detail here. The main inland sources known are the chemical and paper industries, sewage treatment plants, agriculture, air deposition and natural sources. Sources behind the sewage treatment plants were not traced in this study. Most of the emissions to air originate from the chemical industry. For the agricultural sources, legislation related to fertilisers and animal feed are applicable. The Integrated Pollution Prevention and Control directive is relevant for emissions from industry. This directive restricts emission from installations to water, land and air. A drawback of the Integrated Pollution Prevention and Control Directive is that it is limited to installations exceeding certain capacity boundaries.

In the Netherlands, the Environmental Quality Standard for cadmium is exceeded mostly in international rivers; this cadmium exceedance is due to sources across the border. The transboundary pollution problems will have to be solved at international level by means of the Water Framework Directive and the Integrated Pollution Prevention and Control Directive. The former demands complete elimination of Priority Hazardous Substances.

The recommendation was to analyse cadmium pollution sources in more detail to be able to investigate the Water Framework Directive requirement for complete cessation of emission and losses for this Priority Hazardous Substance. Additionally, implementation of the relevant European legislation into national legislation and the enforcement of national legislation should be checked, since these are both important factors for effective reducing of emissions.

1 Introduction

The Water Framework Directive (WFD, 2000/60/EC) is designed to maintain and improve the aquatic environment in the Community. The environmental objectives for surface water are described in article 4 of the WFD. For chemical substances, a distinction is made between the approach for priority substances (including the priority hazardous substances) and for hazardous substances in general. This distinction is related to the distinct responsibilities for the European Commission (EC) and the Member States. The EC chooses the substances to be added to the priority list (Annex X of WFD) and designs the measures to be taken for these substances and the Member States propose hazardous substances to be incorporated in the river basin plans and the necessary measures.

The priority substances of the WFD were adopted through Community Directive 2455/2001/EC and were added to the WFD as annex X (article 16(11)). Environmental quality standards (EQSs) have been proposed in final draft daughter directive on environmental quality standards in the field of water policy (2006PC0397; daughter directive EQS). EC-proposals for measures for the priority substances as mentioned in article 16(6) may have provided a good starting point for the Member States in defining measures for the hazardous substances. However, in the draft daughter directive on EQS and emissions, the EC has not submitted a proposal for control measures of the priority substances. It was stipulated that it was more cost-efficient and proportionate to formulate measures nationally instead of at Community level. Moreover, it was found that ‘there is already in place (or pending) a significant body of EU emission control legislation which is contributing significantly to achievement of the WFD objectives for priority substances.’ (Explanatory memorandum of draft daughter directive EQS). Therefore, the Member States need to establish the controls on the principal sources of discharges of priority substances themselves.

In article 10 of the WFD, the Member States are obliged to take into account ‘any other relevant Community legislation’ when formulating measures. In 2005, a study was performed at the National Institute for Public Health and the Environment of the Netherlands (RIVM) to gain overview of the ‘other relevant Community legislation’, which might be helpful during the establishment of measures (Vos and Janssen, 2005). Nine directives and regulations were appointed as legislation with broad extent considering the range of substances or measures. All nine directives and regulations had their own references to other legislation and were amended several times. A short survey on Eur-Lex (<http://europa.eu.int/eur-lex/>) learned that the number of legislation in which a substance name is mentioned varies greatly among substances. Number of hits on substance name for cadmium, mercury, PCBs and trichloromethane was 158, 277, 54 and 3, respectively (search d.d. June 2006).

In the present study, the extent of relevant European legislation applicable to reduce the emission of a WFD-substance was investigated in more depth. Cadmium was chosen as case study. Legislation mentioning cadmium or heavy metals was sought and listed. After the search for legislation, relevance and potential of the legislation for the control and reduction of emission of cadmium to the environment was evaluated. Sources of emission were not specifically investigated in the present study but information on cadmium pollution was borrowed from overview articles.

Cadmium is a Priority Hazardous Substance of the WFD for which a draft Risk Assessment Report (draft RAR, 2003) is composed under the Existing Substances Regulation (793/93/EEC), followed by a Risk Reduction Strategy (Ecolas, 2006). The draft RAR gives first insight in the

emission routes of cadmium in Europe. Emission routes of cadmium are diverse, which was one of the reasons to choose this substance as a case study. Another reason was that concentrations of cadmium in several surface waters exceed the EQS (Unie van Waterschappen, 2006; Van den Roovaart and Wagemaker, 2006).

2 Methods

Eur-Lex ('The access to European Union law': <http://europa.eu.int/eur-lex/>) was searched for Community legislation. Search terms used during the search in Eur-Lex were 'cadmium' and 'heavy metal(s)'. A search for the abbreviation Cd did not work due to the high frequency in which this sequence of letters occurs having a different meaning.

Only acts in force were investigated in detail. Analysis of content of the legislation was preferably carried out on the basis of the consolidated versions, when available. Search terms were applied in the "Simple Search"-option in order to search in all types of legislation, in both title and content. Available additional sources consulted were the draft Risk Assessment Report for cadmium (draft RAR; European Chemical Bureau, 2003), the Environmental and Human Health Risk Reduction Strategy for cadmium (Ecolas, 2006), the informal background document related to the Commission documents on Priority Substances for source identification and emission control (EC, 2005), the WFD and its re directives 2455/2001/EC, draft proposal on environmental quality standards (COM(2006)397 final) and 2006/11/EC, the substances measure sheet for cadmium (Anonymous, 2004), and the report of Vos and Janssen (2005). This literature was screened for additional relevant legislation to the legislation found during the search in Eur-Lex. No search in the open literature was performed for relevant documents.

All resulting legislation was listed and analyzed for subject. Legislation regulating emission to the environment, laying down quality standards in the environment and in products, regulating exposure of humans, monitoring criteria and protecting the environment in general were considered to be relevant for emission control. The selected legislation was submitted to a rough categorization on environmental compartment and type of control measure.

Legislation concerning analytical methods, public participation, information exchange and procedural rules was not categorized as relevant legislation for the emission control of cadmium, although these instruments may contribute to emission reduction indirectly. When cadmium or heavy metals are only mentioned in the considerations of legislation, without mentioning cadmium in the body of the text or in the Annexes, this legislation was also not considered to be relevant for the emission reduction of cadmium.

3 Results

The search for legislation in Eur-Lex resulted in a large number of directives, regulations and decisions containing the search terms cadmium and heavy metal(s) (see Table 1). Less than half of the found legislation was actually relevant for emission reduction of cadmium and still in force. Not relevant legislation concerned for instance analytical standardization, other heavy metals than cadmium or other dangerous substances, formation of international cooperation or general marketing provisions for fertilizers. In some cases, it was unclear why these documents were the result of the search, since the documents did not contain any of the search terms (e.g. directives on dioxins in foodstuffs and feeding stuffs 2004/704/EC and 2004/705/EC). Relevant legislation was diverse as well and e.g. aimed to reduce or control cadmium emissions to air, water or soil in general; aimed to reduce cadmium levels in e.g. fertilizers and batteries; or established ecological criteria for the award of the Community eco-label. The WFD and daughters were also among the search results of Eur-Lex. Additional and relevant legislative tools were found in much lower numbers in the consulted literature (6 additional studies).

Table 1 Results of the literature search

Sources	Number of legislative items
Eur-Lex:	
-cadmium	245
-heavy metal	50
-total (cadmium and heavy metal(s))	276
-total in force	174
<u>Additional</u> (and relevant) from literature:	
-WFD and re directives ¹	3 (76/160/EEC, 79/923/EEC, 92/43/EEC)
-RAR (ECB, 2003)	0
-Ecolas (2006)	4 (67/548/EEC, 79/923/EEC, 1991R2092, 2001/37/EC)
-Background document on Priority Substances (EC, 2005)	0
-Vos and Janssen (2005)	0
-Substances measure sheet (Anonymous, 2004)	0
Total	282
Relevant and in force	117

A small number of additional relevant legislation (#3) was found in the Water Framework Directive (WFD). This additional legislation concerned environmental quality for the conservation of wild life habitats. This legislation obliges Member States to protect wild life habitats in general terms, but does not set specific quality standards and did not mention any of the search terms in specific, i.e. directives 78/659/EEC on fish water, 79/923/EEC on shellfish water and 92/43/EEC on natural habitats.

¹ WFD re directives are 2455/2001/EC, draft proposal EQS COM(2006)397 final and 2006/11/EC. For a short description see paragraph 3.1.

More additional relevant legislation in force was found in Ecolas (2006). In the Classification and Labelling directive (67/548/EEC), cadmium was specifically mentioned in an Annex to the directive. The Regulation on organic production of agricultural products (1991R2092) sets limit values for cadmium in e.g. composted or fermented household waste in an Annex to the Regulation. Another directive mentioned in Ecolas (2006) and not found in Eur-Lex was Directive 2001/37/EC on tobacco. This directive sets limits on tar in tobacco, which in its turn may contain cadmium. Cadmium itself is not mentioned in the directive.

In Appendix I, all relevant legislation is categorized and in short information relevant for cadmium is given. Below relevant legislation which can not be summarized in a few sentences is shortly explained and relevance for cadmium emission control is indicated.

3.1 Water Framework Directive 2000/60/EC and daughter directives 2455/2001/EC, draft proposal EQS and 2006/11/EC

Generally, the Water Framework Directive (WFD, 2000/60/EC) aims to protect the quality of water to safeguard the aquatic ecology, valuable habitats, drinking water resources, and bathing water. All these objectives must be integrated for each river basin in river basin plans. Requirements to special habitats, drinking water areas and bathing water apply only to specific bodies of water, but ecological protection should apply to all waters. For this reason, a general requirement for ecological protection, and a general minimum chemical standard, was introduced to cover all surface waters. Good chemical status is defined in terms of compliance with all the quality standards established for chemical substances at European level (http://ec.europa.eu/environment/water/water-framework/info/intro_en.htm).

Decision N° 2455/2001/EC has established the list of priority substances (Annex X of Directive 2000/60/EC), in which cadmium is specified as a Priority Hazardous Substance, implying that cadmium discharges, emissions and losses needs to have stopped within 20 years after adoption of the proposal for directive on environmental quality standards (EQS, COM(2006)397 final). The quality standard established by the Cadmium Directive (83/513/EEC) will be repealed when re directive EQS comes into force.

Cadmium is specifically mentioned in consideration no. 4 of 2001/2455/EC no. 4: “For substances occurring naturally, or produced through natural processes, such as cadmium, mercury and polyaromatic hydrocarbons (PAHs), complete phase-out of emissions, discharges and losses from all potential sources is impossible. When the relevant individual directives are drawn up, this situation must be properly taken into account and measures should aim at the cessation of emissions, discharges and losses into water of those priority hazardous substances which derive from human activities.”

In the Annex of draft directive on EQS the following EQSs for cadmium are proposed, which are presented in Table 2.

Table 2 EQS proposed in draft directive on EQS

µg/l	CAS no.	AA-EQS	AA- EQS	MAC- EQS
		Inland surface waters	Other surface waters	Inland surface waters and other surface waters
Cadmium and its compounds	7440-43-9	≤ 0.08 (Class I)	0.2	≤ 0.45 (Class I)
		0.08 (Class 2)		0.45 (Class 2)
		0.09 (Class 3)		0.6 (Class 3)
		0.15 (Class 4)		0.9 (Class 4)
		0.25 (Class 5)		1.5 (Class 5)

Note: 'For Cadmium and its compounds (No. 6) the EQS values vary dependent upon the hardness of the water as specified in four class categories (Class I: <40 mg CaCO₃/l, Class 2: 40 to <50 mg CaCO₃/l, Class 3: 50 to <100 mg CaCO₃/l, Class 4: 100 to <200 mg CaCO₃/l and Class 5: ≥ 200 mg CaCO₃/l).'

Directive 2006/11/EC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community demands that Member States take appropriate measures to eliminate pollution of the waters by the dangerous substances in List I of Annex I, and to reduce pollution of these waters by the dangerous substances in the families and groups of substances in List II of Annex I. Cadmium and its compounds are listed in List I of Annex I. All discharges which are liable to contain any of List I substances, require prior authorisation by the competent authority of the Member State concerned. Member States have to establish programmes to reduce pollution of List I substances for which deadlines are set by the Member States themselves.

The WFD and its re directives are considered to be strong tools for emission control of cadmium to surface waters. These directives keep the whole of the European Union to the quality standards for cadmium and to complete elimination of emission of cadmium to water.

3.2 Dangerous Substances Directive (76/464/EEC) and daughter Cadmium directive (83/513/EEC)

The Dangerous Substances Directive (DSD, 76/464/EEC) aimed to safeguard water quality by eliminating 'List I' substances and by reducing pollution by 'List II' substances. The DSD is repealed by 2006/11/EC, described in paragraph 3.1. List I and II substances had to be regulated through a permit or an authorization system for discharges. Cadmium was listed in List I and re directive 83/513/EEC contains cadmium limit values for effluent specified by industry branch. List II substances have to be managed by the MS through pollution reduction programs. List II substances are comparable with the hazardous substances of the WFD (Vos and Janssen, 2005).

Even though the DSD is no longer in force, the limit values and quality objectives established under the re Directives of Directive 76/464/EEC shall continue to apply, until these are established under daughter directive of the WFD on EQS. Limit values and quality objectives for cadmium are shown in Table 3, which is copied from the draft RAR for cadmium (ECB, 2003).

Table 3 Limit values and time limits reported in Annex I of 83/513/EEC (ECB, 2003).

Limit values* for zinc mining, refining lead and zinc and production of nonferrous metals and metallic cadmium 0.2 mg cadmium/l effluent	Details monthly mean measurements (limits for mean of daily measurements = 2-fold)
Limit values for the production of cadmium (compounds) 0.2 mg cadmium/l effluent 0.5 g cadmium/kg processed cadmium	Details mean of one month; total cadmium concentration
Minimum standards for the protection of aquatic life < or = 5 µg/l < or = 5 µg/l < or = 2.5 µg/l	in surface water; total cadmium concentration estuaries; dissolved cadmium in marine territorial waters, coastal waters; dissolved cadmium
Quality objective (target value)** < or = 1 µg/l < or = 1 µg/l < or = 0.5 µg/l and no significant increase of concentration of cadmium in sediments or in ...shellfish and mollusca (e.g. <i>Mytillus edulis</i>)	in surface water; total cadmium concentration estuaries; dissolved cadmium in marine territorial waters, coastal waters; dissolved cadmium
Standards adopted by Member States 0.06 0.01	NI; max. permissible conc.; dissolved NI; target value; dissolved

*: to be considered as 'emission limit value' under the Dir. 2000/60/EC

** : to be considered as 'environmental quality standards' under Dir. 2000/60/EC

In the Cadmium directive emission limits are laid down, but in the draft re directive EQS of the WFD, complete elimination of cadmium emission is demanded. How these two emission demands agree is not completely clear. In general, the most stringent demands in Community legislation govern.

3.3 Drinking Water Directive 98/83/EC

The Drinking Water Directive (DWD) requires that Member States monitor the quality of the drinking water supplied to their citizens and of the water used in the food production industry. This has to be done mainly at the tap inside private and public premises. The DWD sets standards for the most common substances that can be found in drinking water. In the Annexes to the DWD, a total of 48 microbiological and chemical parameters are listed which must be monitored and tested regularly and the minimum requirements are laid down. Standard in water intended for human consumption for cadmium is 5.0 µg/l.

The Commission is currently preparing a revision of the Directive. Main topics to be covered by the revision of the Directive are bacteriological contamination, chemical substances including construction products in contact with drinking water, small water supplies and risk assessment and risk management. Working groups have been set up in order to provide guidance on the

topics. The first conclusions of the working groups will be presented on a new Stakeholder Consultation that will be held on 23 October 2007 (http://ec.europa.eu/environment/water/water-drink/index_en.html, consulted in June 2007).

The limit laid down in the DWD is higher compared to the quality standard in the draft directive EQS. Therefore, this directive is considered not to be a strong tool for emission control of cadmium.

3.4 Marketing and Use Directive 76/769/EEC and amendments 91/338/EEC and 1999/51/EC

Under the Marketing and Use Directive (M&U directive), a framework for bans or restrictions is constructed for substances, preparations and products. The directive concerns point and diffuse sources of emissions on local, national and community level. Each additional measure for a substance has to be included in an amendment of the directive. The Annex contains the list of products covered by the measures provided for in this Directive as well as the conditions governing their placing on the market. The M&U directive will be replaced by REACH in June 2009.

For cadmium and its compounds restrictions are added under item 24 in Annex I, by means of Directive 91/338/EEC and 1999/51/EC. The following restrictions were formulated:

'1.1. May not be used to give colour to finished products manufactured from the substances and preparations listed below:

- polyvinyl chloride (PVC) [390410] [390421] [390422] ⁽⁶⁾
- polyurethane (PUR) [390950] ⁽⁶⁾
- low-density polyethylene (ld PE), with the exception of low-density polyethylene used for the production of coloured masterbatch [390110] ⁽⁶⁾
- cellulose acetate (CA) [391211] [391212] ⁽⁶⁾
- cellulose acetate butyrate (CAB) [391211] [391212] ⁽⁶⁾
- epoxy resins [390730] ⁽⁶⁾

In any case, whatever their use or intended final purpose, finished products or components of products manufactured from the substances and preparations listed above coloured with cadmium may not be placed on the market if their cadmium content (expressed as Cd metal) exceeds 0,01 % by mass of the plastic material.

1.2. Section 1.1 also applies from 31 December 1995 for:

(a) finished products manufactured from the following substances and preparations:

- melamine — formaldehyde (MF) [390920] ⁽⁶⁾
 - urea — formaldehyde (UF) [390910] ⁽⁶⁾
 - unsaturated polyesters (UP) [390791] ⁽⁶⁾
 - polyethylene terephthalate (PET) [390760] ⁽⁶⁾
 - polybutylene terephthalate (PBT)
 - transparent/general-purpose polystyrene [390311] [390319] ⁽⁶⁾
 - acrylonitrile methacrylate (AMMA)
 - cross-linked polyethylene (VPE) ⁽⁶⁾
 - high-impact polystyrene
 - polypropylene (PP) [390210] ⁽⁶⁾
- (b) paints [3208] [3209] ⁽⁶⁾

However, if the paints have a high zinc content, their residual concentration of cadmium must be as low as possible and at all events not exceed 0,1 % by mass.

1.3. However, Sections 1.1 and 1.2 do not apply to products to be coloured for safety reasons.

2.1. May not be used to stabilize the finished products listed below manufactured from polymers or copolymers of vinyl chloride:

- packaging materials (bags, containers, bottles, lids) [3923 29 10] [392041] [392042] (6)
- office or school supplies [392610] (6)
- fittings for furniture, coachwork or the like [392630] (6)
- articles of apparel and clothing accessories (including gloves) [392620] (6)
- floor and wall coverings [391810] (6)
- impregnated, coated, covered or laminated textile fabrics [590310] (6)
- imitation leather [4202] (6)
- gramophone records [852410] (6)
- tubes and pipes and their fittings [391723] (6)
- swing doors (6)
- vehicles for road transport (interior, exterior, underbody) (6)
- coating of steel sheet used in construction or in industry (6)
- insulation for electrical wiring (6)

In any case, whatever their use or intended final purpose, the placing on the market of the above finished products or components of products manufactured from polymers or copolymers of vinyl chloride, stabilized by substances containing cadmium is prohibited, if their cadmium content (expressed as Cd metal) exceeds 0,01 % by mass of the polymer.

These provisions enter into force on 30 June 1994.

2.2. However, Section 2.1 does not apply to finished products using cadmium-based stabilizers for safety reasons.

3. Within the meaning of this Directive, 'cadmium plating' means any deposit or coating of metallic cadmium on a metallic surface.

3.1. May not be used for cadmium plating metallic products or components of the products used in the sectors/ applications listed below.

(a) equipment and machinery for:

- food production: [8210] [841720] [841981] [842111] [842122] [8422] [8435] [8437] [8438] [847611] (6)
- agriculture [841931] [842481] [8432] [8433] [8434] [8436] (6)
- cooling and freezing [8418] (6)
- printing and book-binding [8440] [8442] [8443] (6)

(b) equipment and machinery for the production of:

- household goods [7321] [842112] [8450] [8509] [8516] (6)
- furniture [8465] [8466] [9401] [9402] [9403] [9404] (6)
- sanitary ware [7324] (6)
- central heating and air conditioning plant [7322] [8403] [8404] [8415] (6)

In any case, whatever their use or intended final purpose, the placing on the market of cadmium-plated products or components of such products used in the sectors/applications listed in (a) and (b) above and of products manufactured in the sectors listed in (b) above is prohibited.

3.2. The provisions referred to in Section 3.1 are also applicable from 30 June 1995 to cadmium-plated products or components of such products when used in the sectors/applications listed in (a) and (b) below and to products manufactured in the sectors listed in (b) below:

(a) equipment and machinery for the production of:

- paper and board [841932] [8439] [8441] (6)
- textiles and clothing [8444] (1) [8445] [8447] [8448] [8449] [8451] [8452] (6)

(b) equipment and machinery for the production of:

- industrial handling equipment and machinery [8425] [8426] [8427] [8428] [8429] [8430] [8431] (6)

- road and agricultural vehicles [chapter 87] ⁽⁶⁾
- rolling stock [chapter 86] ⁽⁶⁾
- vessels [chapter 89] ⁽⁶⁾

3.3. However, Sections 3.1 and 3.2 do not apply to:

- products and components of the products used in the aeronautical, aerospace, mining, offshore and nuclear sectors whose applications require high safety standards and in safety devices in road and agricultural vehicles, rolling stock and vessels,
- electrical contacts in any sector of use, on account of the reliability required of the apparatus on which they are installed.

4. Austria and Sweden, which already apply restrictions to cadmium going further than those prescribed in Sections 1, 2 and 3 may continue to apply these restrictions until 31 December 2002. The Commission will review the provisions on cadmium in Annex I to Directive 76/769/EEC before this date in light of the results of risk assessment for cadmium and of development of knowledge and techniques in respect of substitutes for cadmium.”

“(6) Council Regulation (EEC) No 2658/87 of 23 July 1987 on the tariff and statistical nomenclature and on the Common Customs Tariff (OJ No L 256, 7. 9. 1987).”

Cadmium is appointed as carcinogenic (point 29 in Annex I), mutagenic (point 30) and as toxic for reproduction, category 2 (point 31). For these categories, further restrictions are formulated in the Annex:

‘29. Substances which appear in Annex I to Directive 67/548/ EEC classified as carcinogen category 1 or carcinogen category 2 and labelled at least as ‘Toxic (T)’ with risk phrase R 45: ‘May cause cancer’ or risk phrase R49: ‘May cause cancer by inhalation’, and listed as follows:

Carcinogen category 1: See List 1 in the Appendix.

Carcinogen category 2: See List 2 in the Appendix.

Without prejudice to the other points of Annex I to Directive 76/769/EEC:

May not be used in substances and preparations placed on the market for sale to the general public in individual concentration equal to or greater than:

- either the concentration specified in Annex I to Council Directive 67/548/EEC ⁽⁷⁾, or
- the concentration specified in point 6, Table VI, of Annex I to Council Directive 88/379/EEC ⁽⁸⁾, where no concentration limit appears in Annex I to Directive 67/548/EEC.

Without prejudice to the implementation of other Community provisions relating to the classification, the packaging of such substances and preparations must be marked legibly and indelibly as follows: ‘Restricted to professional users’.

By way of derogation, this provision shall not apply to:

- (a) medicinal or veterinary products as defined by Council Directive 65/65/EEC ⁽⁹⁾;
- (b) cosmetic products as defined by Council Directive 76/768/EEC ⁽¹⁰⁾;
- (c) motor fuels which are covered by Council Directive 85/210/EEC ⁽¹¹⁾,
 - mineral oil products intended for use as fuel in mobile or fixed combustion plants,
 - fuels sold in closed systems (e.g. liquid gas bottles);
- (d) artists’ paints covered by Council Directive 88/379/EEC ⁽¹²⁾.

30. Substances which appear in Annex I to Directive 67/548/EEC classified as mutagen category 1 or mutagen category 2 and labelled with risk phrase R46: ‘May cause heritable genetic damage’, and listed as follows:

Mutagen category 1: See List 3 in the Appendix.

Mutagen category: See List 4 in the Appendix.

Without prejudice to the other points of Annex I to Directive 76/769/EEC

May not be used in substances and preparations placed on the market for sale to the general public in individual concentration equal to or greater than:

- either the concentration specified in Annex I to Directive 67/548/EEC, or
- the concentration specified in point 6, Table VI, of Annex I to Directive 88/379/EEC where no concentration limit appears in Annex I to Directive 67/548/EEC.

Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of dangerous substances and preparations, the packaging of such substances and preparations must be marked legibly and indelibly as follows: 'Restricted to professional users'.

By way of derogation, this provision shall not apply to:

- (a) medicinal or veterinary products as defined by Directive 65/65/EEC;
- (b) cosmetic products as defined by Directive 76/768/EEC;
- (c) — motor fuels which are covered by Council Directive 85/210/EEC ⁽¹¹⁾,
— mineral oil products intended for use as fuel in mobile or fixed combustion plants,
— fuels sold in closed systems (e.g. liquid gas bottles);
- (d) artists' paints covered by Directive 88/379/EEC.

31. Substances which appear in Annex I to Directive 67/548/EEC classified as toxic to reproduction category 1 or toxic to reproduction category 2 and labelled with risk phrase R60:

'May impair fertility' and/or R61: 'May cause harm to the unborn child', and listed as follows:

Toxic to reproduction category 1: See List 5 in the Appendix. Toxic to reproduction category 2: See List 6 in the Appendix. Without prejudice to the other points of Annex I to Directive 76/769/EEC

May not be used in substances and preparations placed on

the market for sale to the general public in individual concentration equal to or greater than:

- either the concentration specified in Annex I to Directive 67/548/EEC, or
- the concentration specified in point 6, Table VI, of Annex I to Directive 88/379/EEC where no concentration limit appears in Annex I to Directive 67/548/EEC.

Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of dangerous substances and preparations, the packaging of such substances and preparations must be marked legibly and indelibly as follows: 'Restricted to professional users'.

By way of derogation, this provision shall not apply to:

- (a) medicinal or veterinary products as defined by Directive 65/65/EEC;
- (b) cosmetic products as defined by Directive 76/768/EEC;
- (c)— motor fuels which are covered by Council Directive 85/210/EEC ⁽¹¹⁾,
— mineral oil products intended for use as fuel in mobile or fixed combustion plants,
— fuels sold in closed systems (e.g. liquid gas bottles);
- (d) artists' paints covered by Directive 88/379/EEC.'

⁽⁷⁾ OJ No 196, 16. 8. 1967, p. 1/67.

⁽⁸⁾ OJ No L 187, 16. 7. 1988, p. 14.

⁽⁹⁾ OJ No L 22, 9. 2. 1965, p. 369/65.

⁽¹⁰⁾ OJ No L 262, 27. 9. 1976, p. 169.

⁽¹¹⁾ OJ No L 96, 3. 4. 1985, p. 25.'

When European wide certain substances, preparations or products cause cadmium pollution, the M&U directive can be amended in order to add restrictions. Therefore, the M&U directive is considered to be a flexible tool to control cadmium release from products or their waste.

3.5 REACH Regulation (EC) No 1907/2006

REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) has entered into force on the 1st of June 2007. Enterprises which manufacture or import more than one tonne of a chemical substance per year will be required to register it in a central database administered by the new EU Chemicals Agency.

REACH will require a registration, over a period of 11 years, of some 30,000 chemical substances. The registration process requires the manufacturers and importers to generate data for all chemicals substances produced or imported into the EU above one tonne per year. The registrants must also identify appropriate risk management measures and communicate them to the users.

REACH will allow the further evaluation of substances where there are grounds for concern and foresees an authorisation system for the use of substances of very high concern. This applies to substances that cause cancer, infertility, genetic mutations or birth defects, and to those which are persistent and accumulate in the environment. The Authorisation system will require companies to switch progressively to safer alternatives where a suitable alternative exists. All applications for an authorisation need to include an analysis of alternatives and a substitution plan where a suitable alternative exists. The M&U-directive 76/769/EEC will be repealed by REACH in June 2009. Current use restrictions, also for cadmium uses, will remain under REACH system (Annex 17 to REACH) (Gateway to the European Union, consulted June 2007).

Cadmium has been classified as carcinogenic category 2 (under 67/548/EEC). Such classification can be reason to prioritize cadmium for authorization. Similarly to the M&U directive, REACH is considered to be a strong tool to control cadmium emission from production and products. However, the capacity threshold for installations falling under REACH limits the radiance of the regulation.

3.6 Existing Substances Directive 793/93/EEC

Under the Existing Substances Regulation (ESR), potential risks of priority list chemicals are evaluated in order to protect man and the environment from exposure to dangerous substances via all possible routes. Priority Lists of Existing Substances are established under Commission Regulations No. 1179/94, 2268/95, 143/97 and 2364/2000 and contain 141 substances in total.

The ESR Priority Substances undergo a risk assessment carried out by a MS Rapporteur, following the principles laid down in Regulation 1488/94 and described in detail in the Technical Guidance Document (EC, 2003). If the risk is not adequately managed, a proposal is made for a strategy to reduce the risks. On the basis of the risk assessment and the risk reduction strategy, the Commission may decide to formulate Community measures and to demand national measures. The measures cannot be enforced under ESR, but for instance can take place under M&U, IPPC, or other legislation, such as WFD. The ESR will be repealed by REACH in June 2009.

For cadmium metal and cadmium oxide a final draft RAR is available, which is published in July 2003 (ECB, 2003). The final RAR is not yet completed (d.d. June 2007). For cadmium, also a risk reduction strategy is composed (Ecolas, 2006). Thus, the ESR as tool to reduce emission of cadmium has been played already. Actual measures to reduce cadmium emission have to be constructed under existing or new legislation.

3.7 IPPC 96/61/EC, 166/2006/EC cq. E-PRTR and 2000/479/EC cq. EPER

The Directive concerning integrated pollution prevention and control (IPPC, 96/61/EC) aims to achieve integrated prevention and control of pollution from pollution sources listed in Annex I of the IPPC. Sources covered by the directive are medium-sized and large industrial installations, waste management installations and installations for the intensive rearing of poultry and pigs (Annex I of IPPC). For some of the industrial branches, installations with low production capacity are left out of the scope of the directive (e.g. iron and steel mills with capacity less than 2.5 tonnes per day or paper and board mills with capacity less than 20 tonnes per day). The IPPC demands permits describing measures for integrated protection of water, air and soil. The permits have to contain emission limits for substances, which are emitted in significant quantities. The IPPC allows MS to constitutionalise emission limits in general rules, if these general rules guarantee integrated pollution prevention with a similar protection level.

The IPPC requires an EC inventory of principal emissions and their sources: the European Pollutant Emissions Register (EPER, <http://www.eper.cec.eu.int/>). Directive 2000/479/EC concerns the implementation of EPER. EPER is merged into the new Pollutant Release and Transfer Registers (E-PRTR) established by Regulation 166/2006/EC. E-PRTR includes more pollutants, more activities, releases to land, releases from diffuse sources and off-site transfers. In an annex to E-PRTR, a number of substances and their emission limits are listed.

Annex IV of the IPPC includes issues to be taken into account when determining Best Available Techniques. BAT is defined as ‘the most effective and advanced stage in the development of activities and their methods of operation’ (definition 11 of IPPC). Examples of issues to be included in BAT are the use of low-waste technology, less hazardous substances, recovery and recycling of substances, the nature, effects and volume of the emissions concerned, and the consumption and nature of raw materials.

The Commission organizes an exchange of information between Member States and the industries on BAT (article 16 of IPPC). The results of this information exchange are published as IPPC BAT Reference Documents (BREFs). The BREFs aim at providing reference information for the permitting authority to be taken into account when determining emission limit values. It is important to bear in mind that BREFs are not prescriptive and they do not propose emission limit values but contain information facilitating the permitting procedure of industrial installations. BREFs are an important source of information on the need and possibilities to reduce risks of a certain industrial branch. Such risk reduction possibilities include both substitution of the chemical in question and processing of measures on or outside the plants to prevent or reduce the emissions to non harmful levels (Vos and Janssen, 2005).

Cadmium falls into the category ‘metals and their compounds’ of Annex III of the IPPC: ‘Indicative list of the main polluting substances to be taken into account if they are relevant for fixing emission limit values’. Annex II to 166/2006/EC (E-PRTR) gives threshold levels for reporting to the national authorities of releases to air of 10 kg/year and to water of 5 kg/year and to land of 5 kg/year for cadmium and its compounds. The IPPC and abovementioned related tools can be powerful in the battle against cadmium pollution through the system of authorisation. However, the capacity threshold and reporting thresholds for installations falling under the IPPC limits the reach of the authorisation system. At this moment it is unknown into which proportion of industries emitting cadmium falls under the IPPC. Therefore, cadmium emission not regulated by the IPPC can not be estimated at this moment.

3.8 Council Directive 75/442/EEC on waste and re directive 2000/76/EC on incineration of waste

The Waste Directive lays down general rules applying to waste management. Waste covered by the Waste Directive is listed in Annex I of the directive. The Directive on waste has regularly been amended, latest by Regulation (EC) No. 1882/2003.

Cadmium itself is not mentioned in the directive, but metals and metal compounds are, under point R 4 of Annex IIB: 'Recycling/reclamation of metals and metal compounds'. For the activities listed in Annex IIB, permits have to be obtained.

In addition to Directive 75/442/EEC, Directive 2000/76/EC on the incineration of waste sets stricter emission limit values, in particular for cadmium to air; the total emission limit value of cadmium and thallium is 0.05 mg/m³ as daily average value over a minimum sampling period of 30 minutes and a maximum of 8 hours. The emission limit value for the discharges of waste water from the cleaning of exhaust gases, for unfiltered samples is 0.05 mg/l. These emission limit values should be met by means of stringent operational conditions and technical requirements of the installations (draft RAR, 2005). In case of waste incineration installations, the 2000/76/EC directive is a straightforward tool to reduce cadmium emission. However, it is unclear how the emission limit for cadmium under the 2000/76/EC directive stands in relation to the environmental quality standard of 5 ng/m³ established under the ambient air directive 96/62/EC (see paragraph 3.9 below).

3.9 Directive 96/62/EC on ambient air and re directive 2004/107/EC on cadmium

Council Directive 96/62/EC on ambient air quality assessment and management aims to define the basic principles of a common strategy to define and establish objectives for ambient air quality (AAQ i.e. related to outdoor air excluding workplaces). Cadmium is mentioned in the list of atmospheric pollutants to be taken into account in the assessment and management of AAQ.

Re directive 2004/107/EC sets target values for arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

Article 3.1: 'Member States shall take all necessary measures not entailing disproportionate costs to ensure that, as from 31 December 2012, concentrations of arsenic, cadmium, nickel and benzo(a)pyrene, used as a marker for the carcinogenic risk of polycyclic aromatic hydrocarbons, in ambient air, as assessed in accordance with Article 4, do not exceed the target values laid down in Annex I.'

Article 3.2: 'Member States shall draw up a list of zones and agglomerations in which the levels of arsenic, cadmium, nickel, and benzo(a)pyrene are below the respective target values. Member States shall maintain the levels of these pollutants in these zones and agglomerations below the respective target values and shall endeavour to preserve the best ambient air quality, compatible with sustainable development.'

The re directive lays down requirements for monitoring these pollutants. Member States have to have implemented this directive by February 2007. Annex I reports a target value of 5 ng/m³ for cadmium. How this target value stands in relation with surface water load is not clear. However,

the ambient air directive is an effective and straightforward tool for the reduction of emission to air.

3.10 Protocol on Heavy Metals of UNECE Convention on long-range transboundary air pollution

The Protocol on heavy metals to the UNECE Convention on long-range transboundary air pollution (LRTAP) recommends the adoption of measures to reduce heavy metals emitted by certain installations and has been implemented in Europe by Council Decision 2001/379/EC.

Cadmium falls under the UNECE LRTAP Protocol for Heavy Metals, the aim of which is the reduction of heavy metal emissions due to human activity (at stationary sources) and with the potential of causing harmful effects on human health and the environment. To this end, it stipulates the reduction of total annual emissions into the atmosphere of cadmium, lead and mercury, and the application of product control measures. According to one of the basic obligations, Parties will have to reduce their emissions for these three metals below their levels in 1990 (or an alternative year between 1985 and 1995). The Protocol aims to cut emissions from industrial sources (iron and steel industry, non-ferrous metal industry), combustion processes (power generation, road transport) and waste incineration. It lays down stringent limit values for emissions from stationary sources and suggests best available techniques (BAT) for these sources, such as special filters or scrubbers for combustion sources (Ecolas, 2006).

For quite a number of source categories in the Protocol emission limit values for particulate matter are given instead of emission limit values for the individual metals. The Protocol does contain some emission limit values for lead and mercury, but not for cadmium. For most categories, emission limit values for cadmium, lead and mercury have been identified and applied by some Parties to the Protocol (ECE/EB.AIR/WG.5/2006/2). Presently the Protocol is being reviewed by the UNECE Task Force on Heavy Metals. It is expected that emission limit values for particulate matter will be set at a lower level, but discussion on the status of the emission limit values (mandatory/voluntary) is still ongoing.

3.11 The packaging and packaging waste Directive (i.e. Directive 94/62/EC, Commission Decisions 1999/177/EC and 2001/171/EC

The packaging and packaging waste Directive 94/62/EC and resulted Commission Decisions 1999/177/EC and 2001/171/EC aim to reduce the impact of packing and packing waste by limiting the total quantity that may be put on the market, by enhancing re-use and recycling and by setting limits to hazardous substances. The sum of the concentrations of four heavy metals (lead, cadmium, mercury and hexavalent chromium) in packaging which are not to be exceeded at different points in time, are: 600 ppm (July 1998); 250 ppm (July, 1999) and 100 ppm (July 2001). Exemptions are included in the Annex. For cadmium, the exemption Batteries for electrical vehicles until July 2008 is relevant, with the remark that 'After 31 December 2008, the placing on the market of NiCd batteries shall only be allowed as replacement parts for vehicles put on the market before this date'.

Decision 1999/177/EC adds that Plastic crates and plastic pallets are allowed to exceed the limits of 600 ppm, 250 ppm and 100 ppm (1998, 1999 and 2001, respectively) by weight of the sum of the concentration levels of lead, cadmium, mercury and hexavalent chromium, in case of

compliance with all the conditions established in Articles 4 and 5 of this Decision. Articles 4 and 5 contain the requirements to manufacturing and recycling of the crates and pallets.

Directive 94/62/EC and decisions 1999/177/EC and 2001/171/EC are limited to certain packaging products and their waste. Cadmium limits laid down for these products are very concrete. Therefore, abovementioned directive and decisions are considered to be effective in the battle against cadmium pollution originating from packaging and its waste.

3.12 Directive 86/278/EEC on sewage sludge

Council Directive 86/278/EEC concerns the protection of the environment and in particular of the soil when sewage sludge is used in agriculture. Limit value concentrations have been set for cadmium in soil, in sludge for the agricultural use and for the maximum amounts of cadmium which may be add annually to the agricultural land. Limit values as presented in the draft RAR (2003) are listed in Table 4, Table 5 and Table 6. Interestingly, from the different limit values presented in the tables below can be extracted that directive 86/278/EEC has been implemented differently among European countries.

Table 4 Table 2.2.6. of the draft RAR (2003): Directive 86/278/EEC: on the protection of the environment and in particular of the soil, when sewage sludge is used in agriculture (Annex IA).

Annex IA limit values in soils in mg/kg	Details	Source
1 up to 3	pH 6-7	O.J. N° 181, 1986
Standards adopted by Member States (COM(97) 23 final)		
1 up to 3	BE; Flanders: sandy soil: 1 clay soil: 3; Wallonia: 1	
1 up to 3	E: pH<7: 1; pH>7: 3	
2	F	
1 up to 4	P: pH<5.5: 1; pH 5.5<7: 3; pH>7: 4	
3	UK	

Remark: for DE: limit values: 1.5 mg/kg (or 1 mg/kg dry weight) at pH> 5 and <6 (UBA, comments 2000).

The abbreviations used in the table were not explained in the draft RAR.

Table 5 Table 2.2.7. of the draft RAR (2003): Directive 86/278/EEC: on the protection of the environment and in particular of the soil, when sewage sludge is used in agriculture (Annex IB).

Annex IB Limit values in sludge (mg/kg)	Details	Source
20 to 40		O.J.
Standards adopted in Member States (COM(97) 23 final)		
10 and 12	BE; Flanders: 12; Wallonia: 10	
20 up to 40	E: pH<7: 20; pH>7: 40	
20 up to 40	F: reference value: 20; limit value: 40	
20	P	

Remark: here no data for UK; for S: A charge of 30 SEK per gram of cadmium exceeding 50 g/ton P (changed to 5 g Cd/ton P) was introduced in Sweden in 1994 and was changed to a tax in July 1995 (KEMI, comments 2000); for DE: limit value: 10 mg/kg (or 5 mg/kg dry weight) at pH >5 and < 6 (UBA, comments 2000).

Table 6 Table 2.2.8. of the draft RAR (2003): Directive 86/278/EEC: on the protection of the environment and in particular of the soil, when sewage sludge is used in agriculture (Annex IC).

Annex IC		
Limit values for the introduction of metals in arable soils in kg/ha/year		
0.15		
Standards adopted by Members States (representative for the period '91 – '94) (COM(97) 23 final)		
0.012 and 0.024	BE: Flanders: grassland: 0.012; culture land: 0.024	
0.15	E	
0.06	F	
0.15	P	
0.15	UK	

Remark: for DE: limit value: max. 0.017 kg Cd/ha/a (based on the limit value in sludge and the max. sludge application), max. sludge application of 5 t/ha/3 years (UBA, comments 2000).

The abbreviations used in the table were not elucidated in the draft RAR.

3.13 Directive 2000/53/EC on 'End of Life Vehicles'

The Directive on 'End of Life Vehicles' (2000/53/EC) aims at the prevention of waste from vehicles and at re-use, recycling and other forms of recovery of end-of-life vehicles and their components so as to reduce the disposal of waste as well as at the improvement in the environmental performance of all economic operators involved and especially those directly involved in the treatment of end-of-life vehicles. Limitations of the use of hazardous substances in vehicles are encouraged and the use of heavy metals (lead, mercury, cadmium and hexavalent chromium) in materials and components of vehicles put on the market after July 2003 are prohibited, with exemptions foreseen in Annex II under the specified conditions (at least until 1 January 2003)(draft RAR, ECB, 2003). Exemptions concerning cadmium are thick film pastes, batteries for electrical vehicles (After 31 December 2008, the placing on the market of NiCd batteries shall only be allowed as replacement parts for vehicles put on the market before this

date) and Optical components in glass matrixes used for Driver Assistance Systems (starting July 2007).

For the prevention of waste from vehicles and at re-use, recycling and other forms of recovery of end-of-life vehicles, the 2000/53/EC directive is a strong tool, although limited to waste of products.

3.14 Directives EEE (2002/95/EC), WEEE (2000/96/EC) and amendments 2005/747/EC, 2005/618/EC and 2006/691/EC

In article 4 of directive 2002/95/EC, the Member States are required to ensure that new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE). The amendment 2005/747/EC adds the following exemptions: ‘Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC’ and ‘Lead and cadmium in optical and filter glass.’ Decision 2005/618/EC adds the following amendment: ‘A maximum concentration value of 0.1 % by weight in homogeneous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and of 0.01 % by weight in homogeneous materials for cadmium shall be tolerated.’ Exempted application directed by Decision 2006/691/EEC is ‘Lead and cadmium in printing inks for the application of enamels on borosilicate glass.’

Directive 2002/95/EC should apply without prejudice to other Community legislation in particular the Batteries Directive (91/157/EEC).

Directive 2002/96/EC on waste electrical and electronic equipment aims at the prevention of the waste of EEE (WEEE: including large and small household appliances, IT and telecommunications equipment, tools, toys, medical devices, etc) by promoting re-use, recycling and other forms of recovery. The list of materials and components of WEEE that should be selectively treated (i.e. removed) mentions ‘batteries’.

For reduction of cadmium emission from EEE and WEEE, the EEE and WEEE directives are strong tools, although they are limited to certain types of products.

3.15 Regulations 466/2001/EC and 1881/2006/EC on contaminants in foodstuffs

Regulation 466/2001/EC lays down maximum levels for certain contaminants in foodstuffs. Regulation 1881/2006/EC repeals Regulation 466/2001/EC and presents maximum levels in foodstuffs in an Annex to this Regulation. Levels relevant for cadmium are copied from 1881/2006/EC in the table below. Regulation 1881/2006/EC is not considered to be a strong tool against cadmium pollution, since it does not regulate emission directly.

Table 7. Maximum levels of cadmium in foodstuffs. Copied from Regulation (EC) 1881/2006

3.2	Cadmium	Maximum levels (mg/kg wet weight)
3.2.1	Meat (excluding offal) of bovine animals, sheep, pig and poultry (6)	0.050
3.2.2	Horsemeat, excluding offal (6)	0.20
3.2.3	Liver of bovine animals, sheep, pig, poultry and horse (6)	0.50
3.2.4	Kidney of bovine animals, sheep, pig, poultry and horse (6)	1.0
3.2.5	Muscle meat of fish (24) (25), excluding species listed in 3.2.6 and 3.2.7	0.050
3.2.6	Muscle meat of the following fish (24) (25): anchovy (<i>Engraulis species</i>) bonito (<i>Sarda sarda</i>) common two-banded seabream (<i>Diplodus vulgaris</i>) eel (<i>Anguilla anguilla</i>) grey mullet (<i>Mugil labrosus labrosus</i>) horse mackerel or scad (<i>Trachurus species</i>) louvar or luvar (<i>Luvarus imperialis</i>) sardine (<i>Sardina pilchardus</i>) sardinops (<i>Sardinops species</i>) tuna (<i>Thunnus species, Euthynnus species, Katsuwonus pelamis</i>) wedge sole (<i>Dicologlossa cuneata</i>)	0.10
3.2.7	Muscle meat of swordfish (<i>Xiphias gladius</i>) (24) (25)	0.30
3.2.8	Crustaceans, excluding brown meat of crab and excluding head and thorax meat of lobster and similar large crustaceans (<i>Nephropidae</i> and <i>Palinuridae</i>) (26)	0.50
3.2.9	Bivalve molluscs (26)	1.0
3.2.10	Cephalopods (without viscera) (26)	1.0
3.2.11	Cereals excluding bran, germ, wheat and rice	0.10
3.2.12	Bran, germ, wheat and rice	0.20
3.2.13	Soybeans	0.20
3.2.14	Vegetables and fruit, excluding leaf vegetables, fresh herbs, fungi, stem vegetables, pine nuts, root vegetables and potatoes (27)	0.050
3.2.15	Leaf vegetables, fresh herbs, cultivated fungi and celeriac (27)	0.20
3.2.16	Stem vegetables, root vegetables and potatoes, excluding celeriac (27). For potatoes the maximum level applies to peeled potatoes	0.10

(6) Foodstuffs listed in this category as defined in Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for food of animal origin (OJ L 226, 25.6.2004, p. 22).

(24) Fish listed in this category as defined in category (a), with the exclusion of fish liver falling under code CN 0302 70 00, of the list in Article 1 of Council Regulation (EC) No 104/2000 (OJ L 17, 21.1.2000, p. 22) as last amended by the Act concerning the conditions of accession of the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia and the Slovak Republic and the adjustments to the Treaties on which the European Union is founded (OJ L 236, 23.9.2003, p. 33). In case of dried, diluted, processed and/or compound foodstuffs Article 2(1) and 2(2) apply.

(25) Where fish are intended to be eaten whole, the maximum level shall apply to the whole fish.

(26) Foodstuffs falling within category (c) and (f) of the list in Article 1 of Regulation (EC) No 104/2000, as appropriate (species as listed in the relevant entry). In case of dried, diluted, processed and/or compound foodstuffs Article 2(1) and 2(2) apply.

(27) The maximum level applies after washing of the fruit or vegetables and separating the edible part.

3.16 Directives 2002/32/EC and amendment 2005/87/EC on undesirable substances in animal feed

Directive 2002/32/EC lays down restrictions on undesirable substances in animal feed, e.g. on cadmium. Amendment 2005/87/EC amends limit values for cadmium in animal feed. Limit values are presented in Table 7. Directives 2002/32/EC and 2005/87/EC influence cadmium emission to the environment through animal faeces. However, at this moment it is unknown how effective reduction of cadmium content of animal feed is against cadmium excrement by animals.

Table 8. Limit values copied from amendment 2005/87/EC of directive 2002/32/EC on undesirable substances in animal feed

Undesirable substances	Products intended for animal feed	Maximum content in mg/kg (ppm) relative to a feedingstuff with a moisture content of 12 %
(1)	(2)	(3)
'6. Cadmium (*)	Feed materials of vegetable origin	1
	Feed materials of animal origin	2
	Feed materials of mineral origin except	2
	– phosphates	10
	Additives belonging to the functional group of compounds of trace elements except	10
	– copper oxide, manganous oxide, zinc oxide and manganous sulphate monohydrate	30 (**)
	Additives belonging to the functional groups of binders and anti-caking agents	2
	Premixtures	15 (**)
	Mineral feedingstuffs	
	– containing < 7 % phosphorus	5
	– containing ≥ 7 % phosphorus	0.75 per 1 % phosphorus, with a maximum of 7.5
	Complementary feedingstuffs for pet animals	2
	Other complementary feedingstuffs	0.5
	Complete feedingstuffs for cattle, sheep and goats and feedingstuffs for fish except	1
– complete feedingstuffs for pets	2	
– complete feedingstuffs for calves, lambs and kids and other complete feedingstuffs	0.5	

(*) Maximum levels refer to an analytical determination of cadmium, whereby extraction is performed in nitric acid (5 % w/w) for 30 minutes at boiling temperature. Equivalent extraction procedures can be applied for which it can be demonstrated that the used extraction procedure has an equal extraction efficiency.

(**) The levels shall be reviewed by 31 December 2007 with the aim of reducing the maximum levels.'

3.17 Regulation (EC) No 1013/2006 on shipments of waste

Exports from the Community of the following wastes listed under Annex V are prohibited, when these wastes do not fall under the OECD Decision (Decision C(2001)107/Final of the OECD Council concerning the revision of Decision C(92)39/Final on the control of transboundary movements of wastes destined for recovery operations)(article 36 of 1013R2006).

Part I of Annex V 'Waste subject to the export prohibition in article 36' is divided into two sub-sections: List A lists wastes which are classified as hazardous by Article 1(1)(a) of the Basel Convention, and therefore covered by the export prohibition, and List B lists wastes which are not covered by Article 1(1)(a) of the Basel Convention, and therefore not covered by the export prohibition.

Items from Annex V, relevant for cadmium:

Part I, list A:

'Metal wastes and waste consisting of alloys of any of the following: e.g. cadmium, but excluding such wastes specifically listed on list B.

Part I, list A: Waste having as constituents or contaminants, excluding metal waste in massive form, any of the following: — Cadmium; cadmium compounds

Part I, list A: Waste zinc residues not included on list B, containing lead and cadmium in concentrations sufficient to exhibit Annex III characteristics

Part I, list A: Waste electrical and electronic assemblies or scrap (1) containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode- ray tubes and other activated glass and PCBcapacitors, or contaminated with Annex I constituents (e.g. cadmium, mercury, lead, polychlorinated biphenyl) to an extent that they possess any of the characteristics contained in Annex III (note the related entry on list B, B1110).

Part I, list A: Waste metal cables coated or insulated with plastics containing or contaminated with coal tar, PCB (3), lead, cadmium, other organohalogen compounds or other Annex I constituents, to the extent that they exhibit Annex III characteristics'

Part I, List B (Annex IX to the Basel Convention):

'Clean, uncontaminated metal scrap, including alloys, in bulk finished form (sheet, plate, beams, rods, etc.): cadmium and scrap

Waste batteries conforming to a specification, excluding those made with lead, cadmium or mercury

Metal-bearing wastes arising from melting, smelting and refining of metals: Slags from copper processing for further processing or refining not containing arsenic, lead or cadmium to an extent that they exhibit Annex III hazard characteristics

Electrical and electronic assemblies: — Waste electrical and electronic assemblies or scrap (1)(including printed circuit boards) not containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCB-capacitors, or not contaminated with Annex I constituents (e.g. cadmium, mercury, lead,

polychlorinated biphenyl) or from which these have been removed, to an extent that they do not possess any of the characteristics contained in Annex III (note the related entry on list A, A1180)'

3.18 Council Resolution on a Community action programme to combat environmental pollution by cadmium

This Resolution of 1988 does not contain any legislative obligations, but asks for action to be taken on basis of a proposal for an action programme. In the Resolution of one page long, the Council indicates that the following issues should be the major elements in the strategy for cadmium control:

- '- limitation of the uses of cadmium to cases where suitable alternatives do not exist;
- stimulation of research and development: - of substitutes and technological derivatives, in particular, encouragement to the development of further alternatives to the use of cadmium in pigments, stabilizers and plating;
- related to the cadmium content of the raw materials used for the production of phosphate fertilizers;
- of varieties of tobacco and food plants with a lower cadmium content;
- collection and recycling of products containing cadmium, for example batteries;
- development of a strategy designed to reduce cadmium input in soil, for example by appropriate control measures for the cadmium content of phosphate fertilizers based on suitable technology not entailing excessive costs, taking into account environmental conditions in the different regions of the Community;
- combating significant sources of airborne and water pollution.'

4 Discussion

The present study consists of an extensive search for European legislation relevant for the control of cadmium emission in easily available sources of Community legislation. It is recognized that legislation is not the only tool to initiate pollution reduction. Other means are economic instruments, such as taxes, charges or subsidies, but also means such as public participation, training and education or enforcement. However, background of this study is the WFD requirement to take into account all relevant legislation when formulating measures to reach the water quality demands of the WFD. The search on Eur-Lex resulted in a large number of legislative documents, mostly directives, regulations and decisions, but also some declarations, resolutions, conventions, agreements and protocols. This study firstly focused on the identification of potentially relevant legislation, i.e. are cadmium or heavy metals subject of the contents. Additionally, it was analyzed if the legislation was still in force. Secondly, legislation in force and having cadmium or heavy metals as subject was studied for relevance as tool for cadmium emission control by comparing the legislation with an overview of cadmium emission sources.

Identification of potentially relevant legislation

Eur-Lex proved to be a suitable starting point for the search for measures in European legislation to reduce emission of cadmium. The search terms 'cadmium' and 'heavy metals' resulted in a vast amount of legislation covering a broad variety of measures and routes of emissions. The additionally consulted sources added only a minor number of directives and regulations to the search result of Eur-Lex. It was noted that during the search in Eur-Lex, more general legislation, relevant for a broad range of substances or pollution, but not specifically mentioning substances identity, may not come up via the currently used searching method in Eur-Lex. This more general legislation can be found via other channels, for instance when studying the legislative history of directives or regulations focusing on more narrow subjects. As example is referred to the directives mentioned in the WFD, but not found during the search in Eur-Lex (see chapter 3). For cadmium as a Priority Substance in the framework of the Existing Substances Regulation, a draft RAR (ECB, 2003) and a Risk Reduction Strategy (Ecolas, 2006) are available, which refer to these more generally directed legislation. For substances for which no RARs and Risk Reduction Strategies are available, websites of national Environmental Agencies and of the European Union (http://europa.eu/index_en.htm) may provide information on Community legislation.

A number of documents was not traced back through Eur-Lex. Regulation (EC) No 304/2003 concerning the export and import of dangerous chemicals on the Prior Informed Consent (PIC) is an example of such a document. This regulation did not result from the Eur-Lex search even though cadmium is mentioned in a table of an Annex to the regulation. This table is presented in the pdf-format of the regulation, but not in the html-file of the regulation. Another example is the Directive 67/548/EEC on classification and labeling of dangerous substances. This document did not result from the Eur-Lex search either, but was traced back by Ecolas (2006) and through Decision 2006/24/EC. Here also, cadmium is listed in an Annex to the directive, which is presented in the pdf-file of directive 67/548/EEC but not in the html-file of the same directive. It is suspected that the searching machine behind Eur-Lex only checks the html-files and not the

pdf-files of the legislation. Frequently, the html-files lack tables which may list specific substances and their quality standards or emission limits.

Search terms not used during the present study, but that might result in useful legislation in the specific case of cadmium are 'fertilizers' and 'dust'. Fertilizers are known to contain substantial amounts of cadmium. Therefore, measures reducing fertilizer use will lower cadmium load to land. From dust abatement equipment to reduce dust emissions is known that this simultaneously provides benefits on reducing particle bound heavy metal emissions (see also paragraph 3.10). Identification of useful search terms, however, demands insight in emission sources and routes of the substances in question.

Sources of emission to the environment in relation to effectiveness of legislation

The current search aimed to get a complete overview of European legislation useful to reduce emission of cadmium to the environment. In practice, starting point for a search for Community legislation to handle emission will often be a specific emission source or route of a specific substance. Such knowledge of emission sources will allow to formulate a more defined search profile with the resulting search more focused and less extensive as the search performed during the present study.

Moreover, the relative contribution of the pollution sources handled by certain legislation determines the potential effectiveness of this legislation to reduce the total amount of pollution. If batteries do not contribute to the total cadmium load, directives focusing on cadmium content of batteries potentially have relatively low impact on cadmium pollution.

In cases of pollutants causing problems in the environment, which have a broad range of emission sources (e.g. PAHs), it might be informative to have overview of all statutory tools. By comparing this overview of legislation with an overview of distribution and size of pollution sources, the tools potentially able to deal with the main pollution sources can be identified.

Potential effectiveness of legislation may differ among European countries. Effectiveness of legislation regulating cadmium content of certain specific product depends on factors such as consumption pattern, availability of the products on the market, countries lay-out and population density. The usefulness of legislation setting quality standards depends on the level of pollution and legislation setting emission standards depends on the present types of industry and size of this industry. The potential effectiveness of legislation determining frameworks for the control and protection of certain environmental compartments depends on the geographic distribution of pollution and on the pollution sources. Evidently, effectiveness of measures depends on relative contribution of foreign sources to inland pollution. Transboundary pollution should ideally be solved among the countries concerned and otherwise at European level.

Effectiveness of legislation for emission control

The actual judgment of the effectiveness of certain legislation is not straightforward, even when emission sources are clearly characterised. In the paragraph above it is already discussed that effectiveness and thus, the relevance, of legislation depends of the nature and the dimensions of the emission. Additionally, relevance of legislation depends on the type and stringency of the measures laid down. For instance, there is a long list of decisions concerning ecological criteria for the award of the Community eco-label arising from Regulation 1980/2000 (see Appendix I). The objective of the Community eco-label award scheme is to promote products, which have the potential to reduce negative environmental impacts, as compared with the other products in the

same product group. Relevance of legislation establishing criteria for a Community eco-label is difficult to judge, because it not only needs insight in cadmium releases from use and disposal of certain products, but also in the grounds of consumers leading to a choice for a product.

Then there is the question how effective regulations and directives relating to public health and to occupational exposure for control of emission to the environment are. Such legislation may not be established to reduce pollution emission, but may indirectly do so. Limiting the potential exposure of the population in general or of people during working conditions, may also indirectly lead to lower exposure of the environment to a compound. This will however strongly depend on several factors, such as the characteristics of the compound and emission route to the environment. In the case of cadmium, legislation relating to public health and occupational exposure are not considered to be effective tools to reduce cadmium pollution to the environment, because the regulated products and exposure routes contribute only in minor proportion to the overall cadmium load.

In some cases, a substance is not mentioned in the legislation itself, but is only named in the considerations to the legislation. In these cases, at times it remains unclear if the legislation should be classified as relevant or not. In Regulation (EC) No 2003/2003 relating to fertilisers the following is noted in consideration no. 15:

‘Fertilisers can be contaminated by substances that can potentially pose a risk to human and animal health and the environment. Further to the opinion of the Scientific Committee on Toxicity, Ecotoxicity and the Environment (SCTEE), the Commission intends to address the issue of unintentional cadmium content in mineral fertilisers and will, where appropriate, draw up a proposal for a Regulation, which it intends to present to the European Parliament and the Council. Where appropriate, a similar review will be undertaken for other contaminants.’

This consideration mentions intentions, but not actual action. In the future, the Commission most probably will address the issue of unintentional cadmium content in mineral fertilizers and will draw up a proposal for a Regulation. Therefore, Regulation 2003/2003 (EC) is relevant for the establishment of future legislative means, but not for usage to reduce cadmium emission at this moment.

Cadmium sources in the Netherlands in relation to European legislation

Regarding cadmium sources in the Netherlands, main pollution load to surface water comes from industries fabricating inorganic basic chemicals and other chemical products and from the paper-industry (7-19% of total load to surface water in 2004-2006), from sewage plants (17-35%) and from agriculture (16-37%). An additional proportion is air deposition (20-30%). Air emission in the Netherlands originates mostly from industries fabricating inorganic basic chemicals and industries fabricating iron-, steel- and ferro-alloys and from oil refineries, but this air emission can not directly be translated to air deposition, taking into account factors such as transboundary pollution and different forms of emission. However, air concentrations of cadmium are far below the threshold level set in the 96/62/EC (see paragraph 3.9). Natural sources account for a fairly highly proportion of the total emission to surface water: 25-30% (Anonymous, 2007; Van den Roovaart and Wagemaker, 2006; Manders and Hoogerbrugge, 2007).

On basis of the consulted information sources, sources of cadmium pollution ending up in the sewage plants appear to be difficult to identify and quantify. These sources are expected to be of diverse nature, ranging from human excrement, washing of paved roads to discharges of all kinds of smaller industries. Agricultural sources of cadmium may be traced back to the use of phosphate containing fertilizers and cadmium in animal feed. Consequently, legislation listed under

‘Maximum admissible content in fertilizers’ and ‘Animal nutrition, foodstuff and feeding stuff’ are considered to be of relevance for the emission reduction of cadmium from agricultural land. Emission to air and water by above mentioned industries can be regulated through legislation such as the IPPC and related directives which constitutionalise emission limits for a range of installations (see paragraph 3.7). Cadmium is in the indicative list to be taken into account when relevant for fixing emission limits and the E-PRTR sets general threshold levels for cadmium releases to air, water and land. However, the IPPC is limited to installations with relatively high capacity. Installations having a capacity smaller than a certain threshold do not have to comply with IPPC demands.

In the Netherlands, however, exceeding the EQS for cadmium in surface water is mostly due to cadmium load from abroad, i.e. 75% of the total cadmium load in international surface waters originates from point sources abroad (Anonymous, 2007). These pollution problems have to be solved abroad or internationally in which the IPPC and the WFD can be powerful tools. The IPPC permits of the foreign emission source have to be in line with the IPPC requirements and the WFD quality standards. The IPPC even contains an article dedicated to transboundary pollution (article 17). Member States have to forward information about permit requests to the Member States whose environment may be negatively affected by the installation. ‘Such information shall serve as a basis for any consultations necessary in the framework of the bilateral relations between the two Member States on a reciprocal and equivalent basis.’ and ‘The results of any consultations pursuant to paragraphs 1 and 2 must be taken into consideration when the competent authority reaches a decision on the application.’

The WFD demands cessation or phasing-out of discharges, emissions and losses of priority hazardous substances among which is cadmium. Problems with pollution coming from abroad mostly are resolved with the neighbouring countries directly, but in case countries are not able to settle pollution problems satisfactorily among each other, matters can be brought to European level to solve the question.

Conclusions

- During the present search for legislation concerning cadmium, a long list of directives, regulations, decisions, etc. resulted from a search in Eur-Lex. The first selection of legislation revealed that less than half of the found legislation is still in force and relevant for the reduction of cadmium. Only a minor number of legislation was found in additional sources. The final list of relevant legislation in force is considered to approach completeness (d.d. June 2007). However, it should be borne in mind that Community legislation is produced at high speed.
- The currently used searching method in Eur-Lex exhibits the chance that general legislation, not specifically mentioning a substance name, is ignored. For instance, the bird and habitat directives, which demand good quality of water for the maintenance of good living environment for fish, *et cetera*, but do not specifically prescribe emission limits or quality standards for substances. This more generally oriented legislation on the protection of certain environmental compartments can be identified by search in other sources such as the draft RAR (ECB, 2003) and the draft Risk Reduction Strategy for cadmium (Ecolas, 2006). For substances without a RAR and Risk Reduction Strategy, websites such as those of national Environmental Agencies (in the Netherlands www.rivm.nl/rvs/ of the National Institute for Public Health and the Environment) or of the European Chemical Bureau (<http://ecb.jrc.it/>), where also information on directives and regulations such as REACH or the biocides directive 98/8/EC can be found.
- In the Netherlands, 75% of the cadmium load in international rivers originates from point sources abroad. Therefore, the cadmium pollution in Dutch waters should be resolved internationally. Mostly, pollution problems coming from abroad are first solved among the

countries involved. When Member States are not able to solve the transboundary pollution problem, the case can be brought at European level. In case of cadmium in the surface waters of the Netherlands, the IPPC, the WFD and related directives are identified as the strongest tools in European legislation to fight cadmium pollution. The IPPC permits of the foreign emission source have to be in line with the IPPC requirements and the WFD quality standards. The IPPC and abovementioned related tools can be effective against cadmium pollution through the system of authorisation. However, the capacity threshold for installations falling under the IPPC limits the reach of the authorisation system. Lowering of the capacity thresholds could be considered, but for this it is recommended to assess the relative contribution to total cadmium emission of installations not falling under the IPPC. The WFD sets quality standards with a deadline to reach the required water quality. Moreover, the WFD demands cessation or phasing-out of discharges, emissions and losses of cadmium being a WFD priority hazardous substance.

- The WFD demand of cessation of discharges, emissions and losses of cadmium also implies that Dutch sources of cadmium should be eliminated, even if water concentrations remain below the EQS. Roughly main categories of pollution are chemicals industry, paper industry, sewage treatment plants, agriculture, air deposition and natural sources. Air emission mostly originates from the chemical industry. However, pollution sources behind the actual air deposition can not directly be extracted from air emission data, since between emission and deposition factors such as emission type and transport play a role. Sources behind the sewage treatment plants were not traced back within the present study. For the agricultural sources, legislation related to fertilizers and animal feed are applicable and for emissions by industries the Integrated Pollution Prevention and Control directive is relevant.

Recommendations

- A thorough study needs to be performed on the distribution and dimensions of pollution sources in order to judge which legislation is useful to reduce cadmium emission. Comparing pollution sources with available legislation should then reveal which legislation is potentially able to establish the greatest emission reduction and, additionally, also possible legislative gaps can be identified.
- At national level, implementation of the relevant Community legislation should be investigated. Implementation of European legislation is obligatory, but the implemented tools should also be checked on effectiveness and on (the need for) enforcement. In some instances, enforcement of the implemented tools is imperative in order to make them effective.
- The IPPC capacity thresholds may need further investigation. A study of emissions of installations falling and not falling under the IPPC will give insight if lowering the capacity limits should be considered.

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- ECB ESIS: European Chemical Substances Information System, consulted June 2007. <http://ecb.jrc.it/esis/>
- Gateway to the European Union, consulted June 2007. http://europa.eu/index_en.htm
- N-CLASS Database on Environmental Hazard Classification version 6.1, consulted June 2007. <http://apps.kemi.se/nclass/default.asp>

Risico's van stoffen ("Risks of Substances"), consulted July 2007. www.rivm.nl/rvs/
The access to European Union law, consulted May and June 2007. <http://europa.eu.int/eur-lex/lex/en/index.htm>

Appendix I Legislation relevant for the emission control of cadmium which is in force

n.a.=not applicable

relevant: relevant for emission reduction of cadmium

Categorisation:

EQS environmental quality standard

EQP environmental quality protection: general demand to protect the environment, no explicit standards or limits

EL emission limit/emission prohibited

PQS product quality standard/migration limits from products/use in product prohibited

PQP product quality protection: product quality has to be ensured, no explicit standards but general provisions

ASD authorisation system for discharges

AS authorisation system

N notification

M monitoring

C&L classification and labelling

W waste treatment, recycling

T transport, export

eco quality criteria for the award of Community eco-label

RA risk assessment

In body text	Category			Short notes/explanation
			GENERAL LEGISLATION	
1	PQS	76/769/EEC cq. M&U	Council Directive of 27 July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States	Annex I, issue 24: restricts the use of Cadmium as pigment, stabiliser and for electroplating with certain exemptions

In body text	Category			Short notes/explanation
			relating to restrictions on the marketing and use of certain dangerous substances and preparations	
1	RA	1993R793 cq. ESR	Council Regulation (EEC) No 793/93 of 23 March 1993 on the evaluation and control of the risks of existing substances, referred to as Existing Substances Regulation	Cadmium is identified as Priority Existing Substance. A Risk Assessment Report (RAR) is created for cadmium oxide and cadmium metal.
1	AS/EL	96/61/EC cq. IPPC	Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control	Cadmium is categorised as main polluting substance to be taken into account if relevant for fixing emission limit values
1	EL	2000D479 cq. EPER	Commission Decision 2000/479/EC of 17 July 2000 on the implementation of a European pollutant emission register (EPER) according to Article 15 of Council Directive 96/61/EC	Sets threshold values for reporting emissions.
1	EL	2006R166 cq. E-PRTR	Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC	Sets threshold values for reporting emissions.
1	AS/EL/N	2006R1907 cq. REACH	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC	Takes over restrictions set in 76/769/EEC
			GENERAL POLICY: resolutions, protocols and declarations	
0	EQP/M	1973X1220	Declaration of the Council of the European Communities and of the representatives of the Governments of the Member States meeting in the Council of 22 November 1973 on the programme of action of the European Communities on the environment	Cadmium is mentioned several times, for instance as substance with priority for investigation.
0	EQS/M/	1978Y0711(01)	Council Resolution of 29 June 1978 on an action programme of the	By carrying out research, establish, for certain specific toxic substances such as

In body text	Category			Short notes/explanation
	EQP		European Communities on safety and health at work	asbestos, arsenic, cadmium, lead and chlorinated solvents, exposure limits, limit values for human biological indicators, sampling requirements and measuring methods, and satisfactory conditions of hygiene at the work place. Establish information notices on the risks relating to and handbooks on the handling of a certain number of dangerous substances such as pesticides, herbicides, carcinogenic substances, asbestos, arsenic, lead, mercury, cadmium and chlorinated solvents.
0	EQP/RA	1987X1207	Resolution of the Council of the European Communities and of the representatives of the Governments of the Member States, meeting within the Council of 19 October 1987 on the continuation and implementation of a European Community policy and action programme on the environment (1987-1992)	General Resolution to undertake action to the protect the environment. Cadmium is reported as a substance which needs special attention
1	EQP	1988Y0204(3)	Council Resolution of 25 January 1988 on a Community action programme to combat environmental pollution by cadmium (88/C 30/01)	General resolution. The Council asks the Commision to develop specific measures as identified in the action programme.
0	EQS/M/ EQP	1993X0517	Resolution of the Council and the Representatives of the Governments of the Member States, meeting within the Council of 1 February 1993 on a Community programme of policy and action in relation to the environment and sustainable development - A European Community programme of policy and action in relation to the environment and sustainable development	Before 1997, knowledge of existing levels and setting of norms, compliance with norms for concentrations and identification of potential or existing problems have to be gathered
1	EQP	2001A0517(01)	Protocol to the 1979 Convention on Long-range Transboundary Air Pollution on Heavy Metals	The Protocol on heavy metals to the UNECE Convention on long-range transboundary air pollution recommends the adoption of measures to reduce heavy metals emitted by certain installations.
			WATER	
0	EQS	75/440/EEC	Directive 75/440/EEC of 16 June 1975 concerning the quality required	Cadmium limits are under the characteristics of surface water intended for the

In body text	Category			Short notes/explanation
			of surface water intended for the abstraction of drinking water in the Member States	abstraction of drinking water, i.e. 0.001 or 0.005 mg/L, depending on the water treatment.
1	ASD	76/464/EEC	Council Directive 76/464/EEC of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community	Requires Member States to set up an (prior) authorisation system for discharges of cadmium (among others).
0	EQP	79/923/EEC	Council Directive 79/923/EEC of 30 October 1979 on the quality required of shellfish waters	The concentration of each substance in shellfish flesh must be so limited that it contributes in accordance with Article 1, to the high quality of shellfish products. The concentration of each substance in the shellfish water or in the shellfish flesh must not exceed a level which gives rise to harmful effects on the shellfish and their larvae. The synergic effects of these metals must be taken into consideration.
1	EQP	80/68/EEC	Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances	Comprises cadmium compounds for which MS must prohibit the direct and avoid the indirect introduction to the groundwater. No explicit standards are given.
1	EL	83/513/EEC	Council Directive 83/513/EEC of 26 September 1983 on limit values and quality objectives for cadmium discharges (daughter 76/464) (so called cadmium directive)	Requires Member States to set up an (prior) authorisation system for discharges of cadmium. Contains emission limits and monitoring requirements for effluent.
0	ASD/EQS	1985D613	Council Decision of 20 December 1985 concerning the adoption, on behalf of the Community, of programmes and measures relating to mercury and cadmium discharges under the convention for the prevention of marine pollution from land-based sources	Every discharge of cadmium into the maritime area or into watercourses that affect the maritime area require prior authorization. Such authorizations have to contain emission standards for the discharge. The actual limit values can not be extracted from the Decision due to the html-version. Quality objectives for estuarine waters 5 µg/L; waters affected by discharges 2,5 µg/L; estuary waters up to the freshwater limit 1 µg/L and territorial waters plus waters, other than estuary waters, on the landward side of the base lines from which the breadth of the territorial sea is measured and extending in the case of watercourses up to the freshwater limit 0.5 µg/L.
1	EQS	98/83/EC	Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption	Standards for water intended for human consumption, limit value for cadmium is 5 µg Cd/L
1	EQP	2000/60/EC	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy	Demands quality standard setting for relevant substances and demands taking measures in case of threat to the aquatic system

In body text	Category			Short notes/explanation
1	EQP	2001R2455	Decision No 2455/2001/EC of the European Parliament and of the Council of 20 November 2001 establishing the list of priority substances in the field of water policy and amending Directive 2000/60/EC	Cadmium is identified as a priority hazardous substance, meaning that emissions have to be eliminated.
0	EQP	2006AG0004	Common Position (EC) No 4/2006 of 23 January 2006 adopted by the Council, acting in accordance with the procedure referred to in Article 251 of the Treaty establishing the European Community, with a view to adopting a Directive of the European Parliament and of the Council on the protection of groundwater against pollution	Proposal for a daughter directive of the WFD for the protection of groundwater
1	ASD	2006/11/EC	Directive 2006/11/EC of the European Parliament and of the Council of 15 February 2006 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community	Cadmium is one of the substances listed for which discharges should be eliminated. Rules for handing out authorisations are laid down.
0	EQP	2006/118/EC	Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration	Cadmium is listed in Part B of Annex II as pollutant for which Member States have to consider establishing threshold values.
1	EQP/ASD	2006/113/EC	Directive 2006/113/EC of the European Parliament and of the Council of 12 December 2006 on the quality required of shellfish waters	Cadmium is listed in Annex I as one of the substances that should be monitored and for which a standard has to be set. Members States have to establish measures to meet the standards.
1	EQS	COM(2006)397	Proposal for a directive of the European Parliament and of the Council on environmental quality standards in the field of water policy and amending Directive 2000/60/EC. May 2006.	Environmental Quality Standards (AA- and MAC-EQS) in Annex I for Priority Substances in surface water, depending on water hardness.
			SPECIFIC WATER BODIES	
0	EQP	1982D460	Council Decision of 24 June 1982 on a supplement to Annex IV to the Convention on the protection of the Rhine against chemical pollution	Adoption of action plans for the protection of the Rhine. Limit values are proposed but from Eur-Lex only the html-version of the Decision can be obtained, which does not present the actual limit values. Therefore, it is unclear if this Decision

In body text	Category			Short notes/explanation
				concerns cadmium or not.
0	EQP	1983A0312(01)	Protocol for the protection of the Mediterranean Sea against pollution from land-based sources	Cadmium and its components are listed as substances of which pollution has to be eliminated
0	EL	1985D336	Council Decision of 27 June 1985 concerning a supplement in respect of cadmium to Annex IV to the Convention for the protection of the Rhine against chemical pollution	Adoption of the proposal from the International Commission for the Protection of the Rhine against Chemical Pollution, intended to supplement in respect of cadmium Annex IV to the Convention for the protection of the Rhine against chemical pollution. A long list of limit values for cadmium discharges is given, which is not readable due to html-form.
0	EQP	1994A0820	Agreement relating to the implementation of part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 /* Montego Bay Convention */ This Act originates Council Decision of 25 July 1994 concerning the signing by the European Community of the Agreement relating to the implementation of Part XI of the 1982 United Nations Convention on the Law of the Sea and the provisional application by the Community of that Agreement and of Part XI of the Convention	Refers to Council Directive 83/513/EEC (cadmium directive) which should be followed
0	EQP	1995A0805(01)	Convention on the protection and use of transboundary watercourses and international lakes - Declaration by the Community pursuant to Article 25 (4) of the Convention (1995)	Refers to Council Directive 83/513/EEC (cadmium directive) which should be followed to protect transboundary watercourses
0	EQP	1997A1212(03)	Convention on cooperation for the protection and sustainable use of the river Danube (Convention for the protection of the Danube) - Final act (1997)	Heavy metals and their compounds are listed in the guiding list of hazardous substances
0	EQP	1998A0403(01)	Convention for the protection of the marine environment of the north-east Atlantic	Heavy metals should be part of action programmes
0	EQP	1998A0623	United Nations Convention on the Law of the Sea /* Montego Bay Convention */ This Act originates: Council Decision of 23 March 1998 concerning the conclusion by the European Community of the United Nations Convention of 10 December 1982 on the Law of the Sea and the Agreement of 28 July 1994 relating to the implementation of Part XI thereof	Refers to Council Directive 83/513/EEC (cadmium directive) which should be followed to protect transboundary watercourses

In body text	Category			Short notes/explanation
			AIR POLICY	
0	EQS	80/779/EEC	Council Directive 80/779/EEC of 15 July 1980 on air quality limit values and guide values for sulphur dioxide and suspended particulates (repealed 1999/30)	Gives limit values for sulphur dioxide and suspended particulates.
0	ASD	84/360/EEC	Council Directive 84/360/EEC of 28 June 1984 on the combating of air pollution from industrial plants	The following plants require authorisation (among others): "Plants for the production and melting of non-ferrous metals having installations with a total capacity of over 1 tonne for heavy metals or 0,5 tonne for light metals". Heavy metals and their compounds are in the list of most important polluting substances.
1	EQS/EQP	96/62/EC	Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management	Cadmium should be considered during air quality assessment and management and the Commission should propose quality standards before the start of 2000. According to the draft RAR an air quality standard of 5 ng/m3 has been proposed
0	EQS/EQP	1999/30/EC	Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air	Establishes limit values and alert thresholds for concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air and demands to assess concentrations of these substances. Likely to have impact on heavy metal emissions through limit values for dust emissions
0	EQS/EQP	2001/80/EC	Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants	Establishes limit values and alert thresholds for concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air and demands to assess concentrations of these substances. Likely to have impact on heavy metal emissions through limit values for dust emissions
1	M	2004/107/EC	Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air	Sets target values for monitoring.
			SOIL POLICY	
0	EQS/EL/ PQS/ASD	86/278/EEC	Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is	Limit values concentrations for several substances have been set of the substance in soil, in sludge for the agricultural use. For cadmium, the annual limit value is set

In body text	Category			Short notes/explanation
			used in agriculture	at 1 to 3 mg/kg dry matter for soils with pH 6-7.
0		92/316/EEC	Commission Decision of 11 March 1992 concerning aid envisaged by the Netherlands Government in favour of an environmentally-sound disposal of manure	Public funding of the Dutch national manure bank
0	EQP	COM(2006) 231 final	Proposal for a European Parliament and Council Directive of 22 September 2006 setting out a framework for soil protection and amending Council Directive 2004/35/EC.	Risk areas and polluted sites are identified and provision is made to remediate degraded soil. A legislative framework is proposed.
0	M/EQP	2006R1737	Commission Regulation (EC) No 1737/2006 of 7 November 2006 laying down detailed rules for the implementation of Regulation (EC) No 2152/2003 of the European Parliament and of the Council concerning monitoring of forests and environmental interactions in the Community	Cadmium is in the list of parameters as optional parameter to be included for soil solution monitoring
			MAXIMUM ADMISSIBLE CONTENT IN FERTILIZERS	
0	PQS	1976D116	Council Directive 76/116/EEC of 18 December 1975 on the approximation of the laws of the Member States relating to fertilizers	Lays down quality requirements for fertilizers to be labelled EC-fertilizer. Requirements are not specifically directed to prevent pollution. Cadmium is mentioned in the framework of marketing limitations within Austria, Finland and Sweden.
0	PQS	2002D366	Commission Decision of 15 May 2002 on the national provisions notified by the Republic of Austria under Article 95(4) of the EC Treaty concerning the maximum admissible content of cadmium in fertilizers	Austria is allowed to continue to apply additional national provisions to fertilizer, i.e. a limit value for cadmium of 75 mg/kg P2O5.
0	PQS	2002D398	Commission Decision of 24 May 2002 on the national provisions notified by the Republic of Finland under Article 95(4) of the EC Treaty concerning the maximum admissible content of cadmium in fertilisers	Finland is allowed to maintain its additional national provisions to phosphorus mineral fertilizers, i.e. 50 mg cadmium/kg phosphorus.
0	PQS	2002D399	Commission Decision of 24 May 2002 on the national provisions notified by the Kingdom of Sweden under Article 95(4) of the EC Treaty concerning the maximum admissible content of cadmium in fertilisers	Sweden is allowed to maintain is additional national provisions to fertilizers, i.e. a maximum permissible content of 100 g cadmium per tonne phosphorus.

In body text	Category			Short notes/explanation
0	PQS	2006D390	Commission Decision of 24 May 2006 on the national provisions notified by the Czech Republic under Article 95(4) of the EC Treaty concerning the maximum admissible content of cadmium in fertilisers	Additional national provisions are evaluated with a deadline in December 2006. Cadmium content of phosphorous mineral fertilisers (with 5 % P2O5 or more) cannot exceed 50 mg/kg of P2O5. The market restriction on cadmium in fertilisers is only applicable to national fertilisers. It does not apply to 'EC-type' fertilisers.
0	PQS	2006D349	Commission Decision of 3 January 2006 on the national provisions notified by the Republic of Austria under Article 95(4) of the EC Treaty concerning the maximum admissible content of cadmium in fertilisers	In Austria, it is prohibited to place on the Austrian market phosphorus mineral fertilisers (containing 5 % P2O5 or more) with a cadmium content exceeding 75 mg/kg P2O5. The derogation shall apply until harmonised measures on cadmium in fertilisers are applied at Community level.
0	PQS	2006D348	Commission Decision of 3 January 2006 on the national provisions notified by the Republic of Finland under Article 95(4) of the EC Treaty concerning the maximum admissible content of cadmium in fertilisers	In Finland, it is prohibited to place on the Finnish market phosphorus mineral fertilizers with a cadmium content exceeding 50 mg for each kilogram of phosphorus. The derogation shall apply until harmonised measures on cadmium in fertilisers are applied at Community level.
0	PQS	2006D347	Commission Decision of 3 January 2006 on the national provisions notified by the Kingdom of Sweden under Article 95(4) of the EC Treaty concerning the maximum admissible content of cadmium in fertilisers	Sweden is allowed to maintain is additional national provisions to fertilizers, i.e. a maximum permissible content of 100 g cadmium per tonne phosphorus. The derogation shall apply until harmonised measures on cadmium in fertilisers are applied at Community level.
			PRODUCTS	
0	PQS	76/768/EEC	Council Directive of 27 July 1976 on the approximation of the laws of the Member States relating to cosmetic products (76/768/EEC)	Cadmium is listed as a compound which must not form part of the composition of cosmetic products
0	PQS	84/500/EEC	Council Directive 84/500/EEC of 15 October 1984 on the approximation of the laws of the Member States relating to ceramic articles intended to come into contact with foodstuffs	Migration limits are laid down for cadmium and lead in ceramic articles intended to come into contact with foodstuffs.
0	PQS	88/378/EEC	Council Directive 88/378/EEC of 3 May 1988 on the approximation of the laws of the Member States concerning the safety of toys	A daily limit value for cadmium resulting from the use of toys is laid down, i.e. 0.6 µg per day.
1	PQS	91/338/EEC	Council Directive 91/338/EEC of 18 June 1991 amending for the 10th time Directive 76/769/EEC on the approximation of the laws,	Adds issue 24 to Annex I of 76/769/EEC: restricts the use of cadmium as pigment, stabiliser and for electroplating with certain exemptions.

In body text	Category			Short notes/explanation
			regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations	
0	EQP	1998D2179	Decision No 2179/98/EC of the European Parliament and of the Council of 24 September 1998 on the review of the European Community programme of policy and action in relation to the environment and sustainable development "Towards sustainability"	Priority objectives of the Community have to be e.g. to develop a framework for an integrated, life-cycle orientated product policy, which will address e.g. minimising the use of persistent organic substances, heavy metals and substances with an irreversible impact on health
1	PQS	1999/51/EC	Commission Directive 1999/51/EC of 26 May 1999 adapting to technical progress for the fifth time Annex I to Council Directive 76/769/EEC on the approximations of the laws, regulations, and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (tin, PCP and cadmium)	adds issue 24.4 to the Annex of 76/769/EEC; derogations for Austria and Sweden
1	PQS	2000/53/EC	Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles - Commission Statements: "directive on end of life-vehicles"	Use of heavy metals (lead, mercury, cadmium and hexavalent chromium) in materials and components of vehicles put on the market are prohibited, with exemptions (e.g. cadmium in batteries for electrical vehicles) foreseen in Annex II.
1	PQS	2002/95/EC	Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment	Requires the substitution of various heavy metals (incl. Cadmium) and other chemicals in new EEE put on the market from 1 July 2006
0	PQS	2002/525/EC	Commission Decision of 27 June 2002 amending Annex II of Directive 2000/53/EC of the European Parliament and of the Council on end-of-life vehicles	Requires that batteries in electrical vehicles put on the market after 1/7/2003 do not contain cadmium. A maximum concentration value up to 0,01 % by weight per homogeneous material for cadmium shall be tolerated, provided this substance is not intentionally introduced.
0	C&L	2005/90/EC	Directive 2005/90/EC of the European Parliament and of the Council of 18 January 2006 amending, for the 29th time, Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (substances classified as carcinogenic, mutagenic or toxic to reproduction — c/m/r)	Cadmium is appointed as carcinogenic, mutagenic and reproductive toxic.

In body text	Category			Short notes/explanation
1	PQS	2005D618	Commission Decision of 18 August 2005 amending Directive 2002/95/EC of the European Parliament and of the Council for the purpose of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment	Sets a maximum concentration value of 0,01 % by weight in homogeneous materials for cadmium
1	PQS	2005/747/EC	Commission Decision of 21 October 2005 amending for the purposes of adapting to technical progress the Annex to Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment	Adds exemptions to 2002/95/EC-requirements: "Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC" and "Lead and cadmium in optical and filter glass."
0	PQS/C&L /W	2006/66/EC	Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC	Prohibits placing on the market of portable batteries or accumulators containing more than 0.002% of cadmium by weight. Furthermore, requirements on collection, treatment, recycling and labelling are laid down.
1	PQS	2006/691/EC	Commission Decision of 12 October 2006 amending, for the purposes of adapting to technical progress, the Annex to Directive 2002/95/EC of the European Parliament and of the Council as regards exemptions for applications of lead and cadmium	Exempted application from 2002/95/EC-requirements is "Lead and cadmium in printing inks for the application of enamels on borosilicate glass."
			ECOLOGICAL CRITERIA FOR THE AWARD OF THE COMMUNITY ECO-LABEL	
0	eco	1999D205	Commission Decision of 26 February 1999 establishing ecological criteria for the award of the Community eco-label to personal computers	Requirements to personal computers to be awarded with an EC Eco-label: plastic parts shall have no cadmium or lead added by the manufacturer and shall contain no metal inlays that can not be seperated. 90% of plastic and metal materials in the housing and chassis shall be recyclable
0	eco	2001D687	Commission Decision of 28 August 2001 on establishing ecological criteria for the award of the Community eco-label to portable computers	Requirements to portable computers to be awarded with an EC Eco-label: plastic parts shall have no cadmium or lead intentionally added by the manufacturer and shall contain no metal inlays that can not be seperated. 90% of plastic and metal materials in the housing and chassis shall be recyclable

In body text	Category			Short notes/explanation
0	eco	2001D688	Commission Decision of 28 August 2001 establishing ecological criteria for the award of the Community eco-label to soil improvers and growing media	Requirements to soil improvers and growing media to be awarded with an EC Eco-label: < 1 mg/kg dw
0	eco	2002D231	Commission Decision of 18 March 2002 establishing revised ecological criteria for the award of the Community eco-label to footwear and amending Decision 1999/179/EC	Requirements to footwear to be awarded with an Eco-label: No residues of arsenic, cadmium and lead are allowed in the final footwear product
0	eco	2002D255	Commission Decision of 25 March 2002 establishing the ecological criteria for the award of the Community eco-label to televisions	Establishing the ecological criteria for the award of the Community eco-label to televisions: plastic parts shall have no cadmium or lead intentionally added by the manufacturer and shall contain no metal inlays that can not be separated. 90% of plastic and metal materials in the housing and chassis shall be technically recyclable
0	eco	2002D272	Commission Decision of 25 March 2002 establishing the ecological criteria for the award of the Community eco-label to hard floor-coverings	Establishing the ecological criteria for the award of the Community eco-label to hard floor-coverings: cadmium content is not allowed to exceed 0.1% weight in the glazes of additives
0	eco	2002D371	Commission Decision of 15 May 2002 establishing the ecological criteria for the award of the Community eco-label to textile products and amending Decision 1999/178/EC	Establishing the ecological criteria for the award of the Community eco-label to textile products: levels of ionic impurities in the dyes used shall not exceed 20 ppm, in pigments 50 ppm
0	eco	2002D739	Commission Decision of 3 September 2002 establishing revised ecological criteria for the award of the Community eco-label to indoor paints and varnishes and amending Decision 1999/10/EC	Establishing the ecological criteria for the award of the Community eco-label to indoor paints and varnishes: cadmium is not allowed to be used as an ingredient of these products, although it is accepted that ingredients may contain traces of heavy metals
0	eco	2002D740	Commission Decision of 3 September 2002 establishing revised ecological criteria for the award of the Community eco-label to bed mattresses and amending Decision 98/634/EC	Extractable cadmium has to be below 0.1 ppm in order to obtain the EC eco-label
0	eco	2003D121	Commission Decision of 11 February 2003 establishing the ecological criteria for the award of the Community eco-label to vacuum cleaners	Establishing the ecological criteria for the award of the Community eco-label to vacuum-cleaners: The metal parts shall be easily accessible so as to facilitate disassembly and recycling. Plastic parts shall contain no metal inlays that cannot be separated. The vacuum cleaner (including the power nozzle and the hose) shall not contain ..., cadmium, and/or ... except as allowed in the Annex to Directive 2002/95/EC.

In body text	Category			Short notes/explanation
0	eco	2006/799/EC	Commission Decision of 3 November 2006 establishing revised ecological criteria and the related assessment and verification requirements for the award of the Community eco-label to soil improvers	Concentration of cadmium is not allowed to exceed 1 mg/kg dw in order to be rewarded the EC-label
0	eco	2007D64	Commission Decision of 15 December 2006 establishing revised ecological criteria and the related assessment and verification requirements for the 2007/64 award of the Community eco-label to growing media	In the organic growing medium constituents, the content of cadmium is lower than 1 mg/kg dw in order to obtain the EC eco-label
			ANIMAL NUTRITION , FOODSTUFF AND FEEDING STUFF	
0	PQS	62/2645/EEC	Council Directive on the approximation of the rules of the Member States concerning the colouring matters authorized for use in foodstuffs intended for human consumption	Colouring matters for colouring foodstuffs should not contain cadmium, mercury, selenium, tellurium, thallium, uranium or chromates, or soluble combinations of barium in detectable quantities.
0		88/344/EEC	Council Directive 88/344/EEC of 13 June 1988 on the approximation of the laws of the Member States on extraction solvents used in the production of foodstuffs and food ingredients	Maximum permitted limits of mercury and cadmium in the extraction solvents used in the production of foodstuffs and food ingredients are to be adopted
0	PQS/PQP	88/388/EEC	Council Directive 88/388/EEC of 22 June 1988 on the approximation of the laws of the Member States relating to flavourings for use in foodstuffs and to source materials for their production	Member States shall take all measures necessary to ensure that flavourings do not contain more than 1 mg/kg cadmium
0	PQP	91/493/EEC	Council Directive 91/493/EEC of 22 July 1991 laying down the health conditions for the production and the placing on the market of fishery products	Fish may not to contain any heavy metals in their edible parts at such a level that the calculated dietary intake exceeds the acceptable daily or weekly intake for humans. Quality limits are not given.
0	PQS	1994R2381	Commission Regulation (EC) No 2381/94 of 30 September 1994 amending Annex II to Council Regulation (EEC) No 2092/91 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs	Lays down limitation for e.g. in composted or fermented household waste (for cadmium 0.7 mg/kg dry matter), in soft ground rock phosphate (for cadmium 90 mg/kg P2O5) and in aluminium calcium phosphate (for cadmium 90 mg/kg P2O5)
1	PQS	96/77/EC	Commission Directive 96/77/EC of 2 December 1996 laying down	lays down purity criteria for food additives other than colours and sweeteners as

In body text	Category			Short notes/explanation
			specific purity criteria on food additives other than colours and sweeteners	mentioned in directive 95/2/EC. Cadmium is not allowed in quantities > 1 mg/kg in any of the food additives
0	PQS	99/23/EC	Council Directive 1999/23/EC of 22 April 1999 on the undesirable substances and products in animal nutrition	Maximum content of cadmium in feeding stuffs are laid down
0	PQS	1999/29/EC	Council Directive 1999/29/EC of 22 April 1999 on the undesirable substances and products in animal nutrition	Maximum levels of cadmium in animal nutrition are laid down.
1	PQS	2002/32/EC	Directive 2002/32/EC of the European Parliament and of the Council of 7 May 2002 on undesirable substances in animal feed	Limitation of cadmium content in animal feed
0	PQS	2002R221	Commission Regulation (EC) No 221/2002 of 6 February 2002 amending Regulation (EC) No 466/2001 setting maximum levels for certain contaminants in foodstuffs	Amendment of 466/2001/EC, relevant for cadmium
0	M/PQP	2002H214	Commission Recommendation of 12 March 2002 on the coordinated inspection programmes in the field of animal nutrition for the year 2002 in accordance with Council Directive 95/53/EC	Recommendation that cadmium should be included in monitoring programmes for animal nutrition
1	PQS	2005/87/EC	Commission Directive 2005/87/EC of 5 December 2005 amending Annex I to Directive 2002/32/EC of the European Parliament and of the Council on undesirable substances in animal feed as regards lead, fluorine and cadmium	Limitation of cadmium content in animal feed
1	PQS	2006R1881	Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs	Sets limit value for cadmium in meat, fish, vegetables and fruits
0	PQS	2006/129/EC	Commission Directive 2006/129/EC of 8 December 2006 amending and correcting Directive 96/77/EC laying down specific purity criteria on food additives other than colours and sweeteners	Adds limit values in food additives other to the values in 96/77/EC
			WASTE	
1	EQP/AS/M/W	75/442/EEC	Council Directive 75/442/EEC of 15 July 1975 on waste	Various waste streams relevant for WFD substances are particularly mentioned in the list of (hazardous) waste that falls under the Directives and where measures have to be taken to ensure that waste is disposed of without harming the environment. General directive. Under Annex IIB is listed "Recycling/reclamation

In body text	Category			Short notes/explanation
				of metals and metal compounds" as an activity for which a permit is required.
0	W	91/271/EEC	Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment	Lays down requirements for treatment of urban waste water and some industrial waste water. Requires the identification of sensitive areas. Cadmium is not specifically mentioned in this directive.
0	EQP/W	91/689/EEC	Council Directive 91/689/EEC of 12 December 1991 on hazardous waste	Various waste streams relevant for WFD substances are particularly mentioned in the list of (hazardous) waste that falls under the Directives and where measures have to be taken to ensure that waste is disposed of without harming the environment. Cadmium is one of the substances listed in Annex II: Constituents of the wastes in Annex I.B which render them hazardous when they have the properties described in Annex III (*). Annex III lists properties found to be hazardous.
0	W	1993R259	Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community	Cadmium and its compounds is mentioned several times in the Greenlist of the directive as part of specific waste categories, meaning that these wastes do not fall under the requirements of the directive, with certain exemptions.
0	EQP/M/W/T	1999/31/EC	Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste	Concerns landfill of waste with general provisions with regard to the control of discharges. Heavy metals are recommended as parameters to be analysed in groundwater.
0	W/T	1999R1420	Council Regulation (EC) No 1420/1999 of 29 April 1999 establishing common rules and procedures to apply to shipments to certain non-OECD countries of certain types of waste	Cadmium waste and scrap are listed in Annex A: "Countries and territories which have indicated to the Commission that they do not wish to receive shipments for recovery of certain types of waste listed in Annex II to Council Regulation (EEC) No 259/93" for Brasil and the Russian Federation. Thus, shipment to these countries is prohibited.
0	W/T	1999R1547	Commission Regulation (EC) No 1547/1999 of 12 July 1999 determining the control procedures under Council Regulation (EEC) No 259/93 to apply to shipments of certain types of waste to certain countries to which OECD Decision C(92)39 final does not apply	A list of countries is drawn up to which certain waste shipments should be subjected to the control procedure laid down in Regulation (EC) 259/93
1	EL/W	2000/76/EC	Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste	Set emission limit values to air of exhaust gases. For cadmium, 0.5 mg/l in waste water of cleaning exhaust gases and in air together with thallium an average of

In body text	Category			Short notes/explanation
				0,05 mg/m ³ should be reached.
0	EQP/W	2000/532/EC	Commission Decision of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147)	Various waste streams relevant for WFD substances are particularly mentioned in the list of (hazardous) waste that falls under the Directives 75/442/EEC and 89/369/EEC and where measures have to be taken to ensure that waste is disposed of without harming the environment
0	EQP/M/W	2001/80/EC	Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants	Applies to combustion plants, the rated thermal input of which is equal to or greater than 50 MW. The Commission is obliged to assess the amounts of heavy metals emitted by large combustion plants.
0	EQP/W	2001/118/EC	Commission Decision of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes	Various waste streams relevant for WFD substances are particularly mentioned in the list of (hazardous) waste that falls under the Directives 75/442/EEC and 89/369/EEC and where measures have to be taken to ensure that waste is disposed of without harming the environment
0	M/W	2002R2150	Regulation (EC) No 2150/2002 of the European Parliament and of the Council of 25 November 2002 on waste statistics	Production of Community statistics on the generation, recovery and disposal of waste. Metallic waste is categorised in under the categories to be analysed/monitored.
0	EL/PQS/W	2003D33	Council Decision of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC	This Decision establishes the criteria and procedures for the acceptance of waste at landfills. Cadmium is mentioned particularly (together with mercury) for which additional measures may be necessary, but which have to be notified to the Commission. Leaching limit values and limit values for several categories of waste are reported, also for cadmium.
			PACKAGING AND PACKAGING WASTE	
1	PQS	94/62/EC	European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste	The sum of the concentrations of four heavy metals (lead, cadmium, mercury and hexavalent chromium) in packaging which are not to be exceeded at different points in time, are: 600 ppm (July 1998); 250 ppm (July, 1999) and 100 ppm (July 2001).
1	PQS	1999D177	Commission Decision of 8 February 1999 establishing the conditions	Derogations for cadmium content of plastic crates and pallets

In body text	Category			Short notes/explanation
			for a derogation for plastic crates and plastic pallets in relation to the heavy metal concentration levels established in Directive 94/62/EC on packaging and packaging waste	
0	PQS	2001D171/EC	Commission Decision of 19 February 2001 establishing the conditions for a derogation for glass packaging in relation to the heavy metal concentration levels established in Directive 94/62/EC on packaging and packaging waste	No lead, cadmium, mercury or hexavalent chromium may be intentionally introduced during the manufacturing process of glass packaging
			TRANSPORT, IMPORT AND EXPORT	
0	W/T	1999R1420	Council Regulation (EC) No 1420/1999 of 29 April 1999 establishing common rules and procedures to apply to shipments to certain non-OECD countries of certain types of waste	Countries and territories have indicated to the Commission that they do not wish to receive shipments for recovery of certain types of waste listed in Annex II to Council Regulation (EEC) No 259/93 Brazil and Russian Federation make exceptions for cadmium waste and scrap.
0	T/N	2003R304	Regulation (EC) No 304/2003 of the European Parliament and of the Council of 28 January 2003 concerning the export and import of dangerous chemicals	Export notification. Cadmium is listed in the Annex List of chemicals subject to export notification procedure.
0	W/T/EL	2005/35/EC	Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringements	Incorporating international standards for ship-source pollution into Community law and ensuring that persons responsible for discharges are subject to adequate penalties. Applies to discharges of polluting substances from any ship, irrespective of its flag. 'discharge' shall mean any release howsoever caused from a ship, as referred to in Article 2 of Marpol 73/78
1	W/T	2006R1013	Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste	Cadmium waste is listed in both list subjected to export prohibition and not subjected to export prohibition.
			Directives referred in WFD, but not found during the search in Eur-Lex	
0	EQP	78/659/EEC	Council Directive 78/659/EEC of 18 July 1978 on the quality of fresh	No specific cadmium standard given, but no harmful effects should occur

In body text	Category			Short notes/explanation
			water for fish on the quality of fresh waters needing protection or improvement in order to support fish life	
0	EQP	79/923/EEC	Council Directive 79/923/EEC of 30 October 1979 on the quality required of shellfish waters.	No specific cadmium standard given, but the concentration of cadmium in shellfish should not exceed a level which gives rise to harmful effects on the shellfish and their larvae
0	EQP	92/43/EEC	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora	On the preservation, protection and improvement of the quality of the environment, including the conservation of natural habitats and of wild fauna and flora.
			Directives derived from Ecolas (2006), but not found during the search in Eur-Lex	
0	C&L	67/548/EEC	Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances	Cadmium substances are classified in Annex I e.g. as toxic to aquatic organisms, possible risk for impaired fertility.
0	EQP	79/923/EEC	Council Directive 79/923/EEC of 30 October 1979 on the quality required of shellfish waters.	No specific cadmium standard given, but the concentration of cadmium in shellfish should not exceed a level which gives rise to harmful effects on the shellfish and their larvae
0	PQS	1991R2092	Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs	Sets limit values for metals in composted or fermented household waste: 0.7 mg Cd/kg dw, for soft ground rock phosphate and aluminium calcium phosphate: 90 mg Cd/kg P2O5.
0	PQS	2001/37/EC	Directive 2001/37/EC of the European Parliament and of the Council of 5 June 2001 on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and sale of tobacco products - Commission statement	Restrictions on tar in cigarettes. Cadmium intake is closely related with tar intake.