Proposals for measures and actions for the reduction of pollution from hazardous substances for the Baltic Sea Action Plan

Final Report

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Note: All annexes, except for Annex A.1 are kept in separate documents (files)

Abbreviations

AFS	Anti fouling-system
BAT	Best Available Technique
BDPE	Brominated diphenyl ether
BFR	Brominated Flame retardant
BSAP	Baltic Sea Action Plan
CAS	Chemical Abstracts Service (Registration number)
Cd	Cadmium
DBP	Dibutylphthalate
DEHP	Diethylhexylphtalate
EC	European Commission
EE	Estonia
EINECS	European Inventory of Existing Chemical Substances
ELV	Emission limit value
EU	European Union
FZ	Federal law (Federalny zakon) [Russia]
GHS	Globally Harmonized System
GOST	Gosudarstvennyy standart (State standart) [Russia]
HBCDD	Hexabromocyclododecane
HELCOM	Helsinki Commission
Hg	Mercury
HS	Hazardous substance(s)
HSE	Health, Safety and Environment / Health and Safety Executive
IMO	International Maritime Organisation
IPPC	Integrated Pollution and Prevention Control
ISO	International Standardization Organisation
LT	Lithuania
LV	Latvia
MARPOL	International Convention for the Prevention of Pollution From Ships
MCCP	Medium chain chlorinated paraffin
NACE	Nomenclature générale des activités économiques dans les communautés européennes (General nomenclature for economic activities in the European Communities)
NGO	Non-governmental organisation
NP	Nonylphenol
NPEO	Nonylphenol ethoxilate
OBUV	Tentative safe levels of impact (Orientirochno bezopasnyy uroven vozdeystviya) [Russia]
ODK	Tentative allowed concentration (Orientirovochno dopustimaya koncentraciya [Russia])
ODU	Tentative allowed level (Orientirovochno dopustimyy uroven [Russia])
OP	Octylphenol
OPE	Octylphenol ethoxylate
PBT	Persistent, Bioaccumulative and Toxic
PCB	Polychlorinated biphenyls
PDK	Maximum allowed concentration (Predelno dopustimaya koncentraciya) [Russia]
PDRO	Maximum allowed waste generation and disposal limit from one source [Russia]
PDS	Maximum allowed concentration (Predelno dopustimye sbrosy) [Russia]
PDV	Norms of allowed impact on water bodies (Normativy dopustimogo vozdeystviya na vodnye obekty) [Russia]

PDVV	Maximum allowed negative impact (Predelnoe dopustimoe vrednoe vozdeystvie) [Russia]
PFOA	Perfluorooctanionic acid
PFOS	Perfluorooctane sulfonate
PL	Poland
POPs	Persistent Organic Pollutants
PVC	Polyvinylchlorid
R&D	Research and Development
REACH	Registration, Evaluation and Authorisation of Chemicals
Rospotrebnadzor	Federal Service for the protection of consumer rights (Federalnaya sluzhba po nadzoru v sfere sashchity prav potrebiteley i blagopoluchiya cheloveka) [Russia]
Rostekhnadzor	Federal Agency for ecological, technological, and nuclear safety (Federalnaya sluzhba po ekologicheskomu, tekhnologicheskomu I atomnuyu nadzoru) [Russia]
Rosvodresursy	Federal Agency of Water Resources (Federalnoe agenstvo vodnykh resursov) [Russia]
RU	Russia
SanPiN	Sanitary-epidemiological rules and norms (Sanitarnye pravila, normy I gigienicheskie normativy) [Russia]
SCCP	Short chain chlorinated paraffin
SDS	Safety datasheet
TACIS	Technical Assistance for the Commonwealth of Independent States
TBBPA	Tetrabomobisphenol A
TBT	Tributyltin
TPhT	Triphenyltin
TU	Technical norm
VDK	Temporary allowed concentrations (Vremenno dopustimye koncentracii) [Russia]
WFD	Water Framework Directive

1. Executive Summary

The measures and actions proposed in this report aim to systematically and substantially reduce emissions, losses and discharges of hazardous substances into the South-Eastern Baltic Sea Region. Its regulatory background is the HELCOM strategy with regard to hazardous substances (19/5) as well as the new EU Marine Strategy/Directive and the EU Water Framework Directive. The proposed measures are meant as input for the HELCOM Contracting Parties to support the elaboration of the **Baltic Sea Action Plan (BSAP)**, which will be adopted in November 2007 by the Environmental Ministers of the HELCOM Contracting Parties.

The Project focussed on the conditions in the new EU member states (Estonia, Latvia, Lithuania and Poland) and Russia (North West Region only). By example of 11 (groups of) hazardous substances, the consultant analysed the available information on current uses and emissions of these substances and the current practise in applying the existing regulatory instruments to reduce releases. Based on this analysis, the consultant proposes a suite of 30 actions to promote the long term process towards meeting HELCOM objective in 2020.

The consultant reports a number of key findings:

- The understanding of the concerns related to HELCOM hazardous substances is still low among trade, industry and authorities. This in particular applies to Russia, but also the four new EU member states. Except for heavy metals and Dioxins, HELCOM priority substances are still considered “exotic” and not very relevant. This may have to do with the fact that the “hazardous substance” concept has not been translated from its scientific basis into practical life, and that a public debate on these substances is absent in the new member states and Russia.
- The assessment methodology applied at EU level to identify substances of concern related to persistency and bioaccumulation is partly different from the methodology applied under HELCOM Recommendation 19/5. This concerns the role of measured concentrations of substances in the environment, the cut-off values for bioaccumulation and toxicity and the way to deal with substances for which toxicity information is lacking.
- Even for well known hazardous substances the information on uses and releases into the environment currently available does not allow to measure the progress made so far towards ceasing releases and to target measures accordingly. This is mainly due to the fact that the primary source of information, which are in fact the companies acting in the market, lack information and understanding on use and release of environmentally hazardous substances from their business.
- The main existing information instrument to communicate about environmentally hazardous substances in products supplied to industrial manufacturers of chemical and non-chemical products does not work in practice. Companies are not able to identify environmentally hazardous substances in their raw materials based on the current communication mechanisms with their suppliers.
- The regulatory instruments existing in the EU to target environmentally hazardous substances at product or process level are not systematically applied. This is illustrated in the current study for environmental permitting, for source and pressure analysis in river basins under the Water Framework Directive and for marketing and use restrictions related to certain substances.
- In Russia, the basic regulatory framework to control environmentally hazardous substances is not yet in place. This is due to a fundamentally different understanding of “hazardousness” and “precaution”, a focus on human toxicity in classification of chemicals and practically unworkable approval mechanisms for chemicals.

Based on these findings, the consultant proposes a number of actions aiming to trigger a systematic and sustainable process on risk management related to these substances. It must be highlighted that principally the recommendations apply to all countries, regardless of their size and their contribution to the pollution load into the Baltic Sea. However, from the environmental perspective, it may be more effective, if specific countries predominantly take certain recommendations into account:

- Launching projects of common public interest to illustrate the concern related to hazardous substances based on practical life examples and to publicly discuss suitable measures. The consultant proposes two such projects: “clean fish food from local/regional waters” and “responsible use of fire” in the domestic sector.
- Setting up administrative and research capacity within the HELCOM structures to actively support the EU processes for identification of substances of very high concern related to the marine environment.
- Developing guidance and training to systematically address environmentally hazardous substances in IPPC and other environmental permitting
- Strengthening the personal and technical capacity of the inspectorates responsible for market surveillance to identify substances under marketing and use restriction in chemical products and articles.
- Building up capacity related to implementation and enforcement of REACH. This is recommended in order to make best use of the REACH mechanisms systematically generating and disseminating information related to environmental hazardousness of substances (as such and in products) and conditions of safe use.
- Setting up a programme to reduce dioxin and mercury emission to air from domestic and municipal heating as well as waste management (investment at municipal level, public information campaign and some regulatory measures).
- Accelerating the reduction plans for dioxin and cadmium emissions in steel industry based on BAT implementation at single installation level.
- Launching a public programme to support formulators of construction chemicals and plastic master batches in substituting chlorinated paraffins and brominated flame retardants in their products. The same applies to the textile finishing and plastic conversion sector.
- Carrying out one-off surveys in all target countries related to certain hazardous substances in municipal and industrial sewage systems. Such action should start with (brominated) flame retardants, short and medium chain chlorinated paraffins, nonylphenol (ethoxilates), mercury and cadmium. Based on these surveys, identification of sources should be carried out were elevated levels have been measured.
- Launching a co-operation process between HELCOM and Russia in order to support Russia in technical aspects of law making to introduce the foundation stones for measures related to hazardous substances into Russian legislation. Such work may start from exemplifying suitable legislative measures to introduce marketing and use restrictions for nonylphenols, chlorinated paraffins and brominated flame retardants.
- Launching a pilot project with Russian exporters of Chemicals to the EU (preferably including Baltic States and Poland) to prepare for REACH.

2. About the project

The project has been commissioned to support the **elaboration of measures** for the reduction of emissions, losses and discharges of certain hazardous substances in the Eastern Baltic Sea Region. These measures shall be included into the **Baltic Sea Action Plan (BSAP)**, which will be adopted in November 2007 by the Environmental Ministers. Its regulatory background is the HELCOM strategy with regard to hazardous substances (19/5) as well as the new EU Marine Strategy/Directive and the Water Framework Directive.

The project has been implemented from 1 February until 30 September 2007 by a consortium consisting of the Baltic Environmental Forum Group, a network of non-governmental, not-for-profit organisations in Latvia, Estonia, Lithuania, Russia, and Germany and the three consulting companies: Ökopol (Germany), eko-net.pl (Poland) and Hendrikson & Ko (Estonia).

The Project focussed on the conditions in the new EU member states (Estonia, Latvia, Lithuania and Poland) and Russia (North West Region only). It analyses the use and emissions of 11 (groups of) hazardous substances:

- four brominated flame retardants (BFR's): penta-, octa- and decabrom dephenylether; hexabromocyclododecane (HBCDD)
- tributyl and triphenyltin (TBT and TPhT),
- Endosulphane,
- short chain and medium chain chlorinated paraffin (SCCP and MCCP),
- alkylphenolethoxilates: nonylphenolethoxilates (NP/NPEOS) and octylphenolethoxilates OP/OPEOS.
- PFOS related substances,
- Mercury (Hg) and Cadmium (Cd)
- Dioxins-related substances

The following products are potentially containing the selected hazardous substances: metal cutting fluids; electroplating and other metal surface treatment chemicals; industrial and institutional cleaners as well as car care products; leather, textile and paper finishing chemicals; plastic and rubber compounds; construction chemicals in particular sealants and foams. We have excluded from the original list non-biocidal paints and adhesives due to the fact that their potential contribution to Baltic Sea pollution is unlikely to be significant. As a particular case in Poland, emission data for heavy metals and dioxin emissions from industrial sources, the domestic sector and the municipal sector have been assessed.

The main objectives of the project were: i) to propose actions suitable to substantially contribute to improving the state of the marine environment; ii) to remove substances and sources from the HELCOM work programs that are not an issue anymore and iii) to design an Action Program which contributes to a front-running role of HELCOM in implementing the EU marine strategy and related legislation.

The consortium was asked to deliver information on the use of the target hazardous substances in selected sectors of industry in the five target countries as well as for information on emissions of target hazardous substances. Furthermore it was supposed to provide information on BAT implementation level in companies in the five target countries analysing to which extent BREF requirements and/or HELCOM recommendation are implemented. In consequence to the information analysed the actions should be proposed for the coming BSAP.

Before contracting, the consortium and the HELCOM Lead Countries agreed that no single enterprise will be exposed/named as "Hot Spot" in HELCOM understanding in the final project report, because making information on use and emission of hazardous substances available to the consortium indicates awareness and openness, which is rare in the region, and exposure of such companies would punish the front runners of environmental awareness.

Furthermore it was agreed that a few issues originally requested by the Lead Countries are out of scope of the contract as they would require different experts and methods: i) remediation and clean-up of contaminated sites/landfills; ii) waste gas treatment from landfills related to volatized hazardous substances from municipal waste; iii) waste water treatment from landfills related to hazardous substances from municipal waste; iv) harbour sediment management related to TBT contamination, and v) rain- and storm water treatment to reduce emissions from urban infrastructure.

The main project activities were:

- Analysis of the legal frameworks addressing hazardous substances;
- Tracing back and verifying the information on certain hazardous substances in HELCOM reports and EPER to the source of origin in the country; in case of significant amounts, exploring which actions/measures are planned in the country respectively for the relevant site;
- Identification of particular relevance of certain industry sectors in the region with help of socio-economic statistics;
- Analysis of new Member States' activities to implement action related to WFD priority substances;
- Analysis of set-up and operational practice regarding substance and product registers in the target countries;
- Screening of national pesticide and biocide registers to identify remaining uses of TBT, TPhT and Endosulphane;
- Evaluation of IPPC (and other) permits and inspectorates' practice regarding identification and minimization of hazardous substances at enterprises;
- Identification of users, formulators and distributors in the market using or supplying products potentially containing the target substances; and,
- Evaluation to which extent the project target substances occur in the products, raw materials or emissions of selected companies.

Due to the substantial difference between the Russian system of hazardous substance classification, management and monitoring practices and the EU system, which is valid in the four other target countries, the consortium was in need to apply a different approach for gathering of data and information on Russia. It decided therefore to illustrate findings and proposals for action for Russia in a separate chapter, taking notice of the particularities and differences of the country, but also trying to raise awareness on these differences on both sides, the Russian and the EU member states. This is to initiate better communication in future and to improve mutual understanding with regard to their different hazardous substance concepts.

Poland and the Baltic states, although largely differing in size, are handled in one chapter as all four countries are having the same regulatory framework as basis for their national hazardous substance management strategies. Some available and comparable Russian data are on purpose included into this chapter (No.3) as well to illustrate the information vis-à-vis the other countries and give a regional impression.

3. Characteristics of the HELCOM Catchment Area

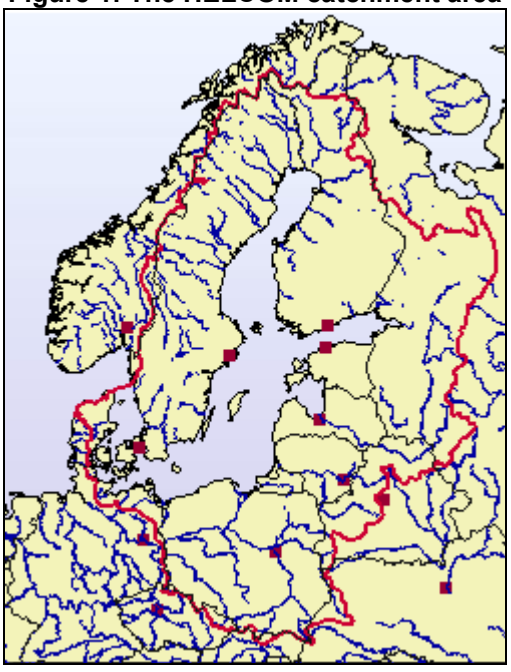
The countries in scope of the study are characterised by one crucial distinctive feature that determines also the arrangement of the report: the Baltic States as well as Poland are members of the European Union since 2004, while Russia remains outside the EU structures and therefore is not obliged to comply with any legislation of the European Union.

Yet, since 1990 the new EU member states have undergone a series of dramatic political, social and economic changes that have had their impact, which is also of concern for the subsequent proposals of measures for the BSAP. The simultaneous transition from planned economy and non-democratic rule was followed by the EU approximation process, which again meant a significant change of principles, rules and procedures for these countries. The process bound a large amount of the national administration. What Western European countries gradually introduced during the European integration process since formation of the Steel and Coal Union in 1952, cannot be expected to be fully and smoothly working in countries which only had about a fifth of the time for its implementation.

This crucial basic feature applies similarly to all five new EU countries. Yet with regard to the Russian Federation, since EU legislation is not an applicable lever for ensuring compliance with certain standards, principles and targets, only international conventions apply.

3.1 Geographical characteristics of the HELCOM Catchment Area[1]

Figure 1: The HELCOM catchment area



At an average depth of just 53 metres, the Baltic Sea is much shallower than most of the world's seas. It contains 21,547 km³ of water (290,000 m3 per inhabitant in the catchment area). Every year rivers bring about 2% of this volume of fresh water into the sea as runoff.
The Baltic Sea is only connected to the world's oceans by the narrow and shallow waters of the Sound and the Belt Sea. This limits the exchange of water with the North Sea, and means

[1] http://www.helcom.fi/environment2/nature/en_GB/nature/

that the same water remains in the Baltic for up to 30 years – along with all the organic and inorganic matter it contains.
The brackish water of the Baltic Sea is a mixture of sea water from the North Sea and fresh water from rivers and rainfall. Salinity levels vary with depth, increasing from the surface down to the sea-floor. The Saltier water flowing in through the Sound and the Belt Sea does not mix easily with the less dense water already in the Baltic, and tends to sink down into deeper basins. At the same time, the less saline surface water flows out of the Baltic. Vertical mixing is limited due to relative sharp boundary between these water masses. This means that the oxygen content and the temperature of the deep basins are low and oxidative degradation processes of pollutants will be very slow (pollutant trap).
The Baltic Sea is much more vulnerable to introduction of hazardous substances compared to the North Sea or the North East Atlantic due to slower water exchange processes and a higher population density per available water volume.

Table 3-1: Geographical characteristics of the HELCOM catchment area[2]

Country	Baltic Sea drainage area (km^2)	% total national area within catchment	% of total catchment area	Inhabitants within HELCOM area in 2000	% of total population in HELCOM area	Population density in catchment area
Denmark	31,110	72.2	1.8	4,682,400	6.2	150.5
Estonia	45,100	99.7	2.6	1,483,942	1.8	32.9
Finland	301,300	89.4	17.5	5,107,790	7.0	17.0
Germany	28,600	8.0	1.7	3,140,000	4.2	109.8
Latvia	64,600	100.0	3.8	2,529,000	3.3	39.1
Lithuania	65,200	100.0	3.8	3,717,700	4.9	57.0
Poland	311,900	99.7	18.1	38,609,000	51.0	123.8
Russia	314,800	1.8	18.3	7,738,000	10.2	24.6
Sweden	440,040	97.8	25.6	8,374,000	11.1	19.0
Total	1720170[3]		100%[4]	75.4 Mio		

The present project covers a bit less than half of the territory of the Catchment area and about 70% of the population. Poland makes about half of the population in the HELCOM Catchment Area, thus plays a key role in reducing emission, losses and discharges of hazardous substances into the Baltic Sea from industrial processes, use of chemical products as well as domestic and municipal heating.

3.2 Socio-economic features of the Eastern HELCOM Catchment Area

In economical terms the Eastern part of the Catchment area is highly volatile with partly enormous growth rates far above the EU average; especially Latvia and Estonia have had high rates most recently. The economic growth has been far above the EU 25 average in the Baltic States particularly. This can have a number of effects related to the release of hazardous substances, including:

- For hazardous substances that are directly correlated with growth of the economy (e.g. emissions and discharges from basic metal, non-metal and basic chemical industry, energy production) the releases may have increased. However, the growth will also be connected with the ability to invest in reduction measures. The extent, to which decoupling of emissions from growth has been achieved by now, has not been investigated in the current study and hence, no conclusions have been drawn.

2 (HELCOM Baltic Sea Environment Proceedings No. 108. Heavy Metal Pollution to the Baltic Sea in 2004, p.6)
3 Including 117,520 km^2 non HELCOM area (Belarus and Ukraine)
4 Including 6.8% non HELCOM

- The wealth of the economy may go hand in hand with a growing demand for environmentally sound products and clean food. This expectation is based on broad empirical evidence that awareness on health and environment grows in a society when the basic needs of daily survival are satisfied.

Table 3-2: Growth of GDP per capita (2001-2006)

	2000	2001	2002	2003	2004	2006
EU 25	3.5	1.7	0.6	1.1	1.1	2.7
Estonia	12.0	7.1	10.0	9.1	13.2	11.6
Latvia	10.5	9.5	4.4	8.3	10.3	12.5
Lithuania	5.9	5.6	5.3	15.0	12.5	7.4
Poland	2.9	2.8	0.0	5.4	2.4	7.1
Russia	10.0	5.4	4.3			

Despite the booming economy, we find very differently sized manufacturing sectors in the five countries. The borderlines may be drawn between the Baltic States, which are fairly similar in size and Poland. This difference in size is crucial for the subsequent report on results.

In 2004, the manufacturing sector in Poland contributes 2.4 % to industrial manufacturing gross value in the EU (6,023 billion EUR in EU 25 compared to 144 billion EUR in EU (EUROSTAT). Compared to this, the Baltic States together contribute 0,003% to the EU manufacturing sector (about 19 billion EUR). Thus, implementation of Best Available Techniques in Poland's manufacturing sector plays a key role for cessation of emissions, losses and discharges of hazardous substances into the Baltic Sea.

In the table below the manufacturing sector is broken down according to where it was most likely to find use of the target substances. Comparable data for North-West Russia were not available due to different structure of statistical data.

Table 3-3: Breakdown of the manufacturing sector (gross value in %, EUROSTAT)

Sector	EU 25	Estonia	Latvia	Lithuania	Poland
Manufacturing	100.0	100.0	100.0	100.0	100.0
Food and Beverages	14.0	18.3	26.0	33.8	20.3
Manufacture of textiles	1.8	5.3	2.9	3.9	1.9
Tanning, dressing of leather; luggage	0.7	0.6	0.1	0.4	0.5
Wood and wood products	2.0	15.9	24.0	6.5	3.2
Pulp and paper	2.7	1.7	1.2	1.0	2.3
Coke, refined petroleum prod., nuclear fuel	6.1	0.8	*c*	23.8	8.0
Chemicals and chemical products	10.0	5.6	2.7	5.0	7.4
Rubber and plastic products	4.0	3.9	2.9	4.7	5.1
Non-metallic mineral products	3.5	5.6	4.1	3.0	4.5
Basic metals	4.8	0.3	7.0	0.2	5.1
Fabricated metal products	6.7	8.7	4.0	3.7	6.4
Machinery and equipment n.e.c	8.8	3.3	2.8	2.7	5.3
Motor vehicles, trailers and semi-trailers	11.7	2.0	0.5	0.5	9.7
Other transport equipment	2.6	2.9	2.6	2.0	1.8
Furniture	2.7	6.8	4.5	4,9	4,5

Sector	EU 25	Estonia	Latvia	Lithuania	Poland
Other	18.0	18.3	14.5	3,8	14,0

From the sector break down a number of conclusions can be drawn related to hazardous substances

- Manufacture of textile (including use of textile finishing products) play a more important role in the Baltic States compared to the EU. The same applies to wood and furniture production. A relevant share of these products is exported to EU countries with high consumer awareness related hazardous chemicals in products[5]. Thus, these two sectors may have an intrinsic motivation to raise their knowledge on hazardous substances in their raw materials.
- Compared to the Baltic States, Poland has a large base chemicals and base metal sector with the corresponding emissions. However, base metal production (Latvia) and fertiliser production (Lithuania) play a role in the Baltic States itself.

3.3 Structure of Chemicals manufacturing and trade

The following section takes a closer look at the structure of the Chemicals industries in the four EU members:
While the Estonian (5.6% or the manufacturing industries) and Lithuanian (5.0%) chemicals industry are comparatively similar in terms of turnover, the sector is by a third smaller in Latvia (2.7%). Significant sub-sectors are Basic chemicals in Estonia and Lithuania, painting and coating in Estonia and Latvia and pharmaceuticals in Latvia. The Polish chemicals industry (7.3%) rests on three major sub-sections, the production of basic chemicals, pharmaceuticals and the production of detergents.

Table 3-4: Composition of the chemicals sector in the target countries (EUROSTAT, gross values in %)

Sub-sector	Estonia	Latvia	Lithuania	Poland	EU 25 total
Total	100.0	100.0	100.0	100.0	100.0
Basic	37.9	7.8	85.0	36.4	44.1
Agrochem	*c*	*c*	*c*	1.4	1.6
Paints, coatings	39.4	20.3	2.9	7.5	6.6
Pharmaceuticals	*c*	45.7	*c*	18.7	29,9
Detergents	3.8	16.0	2.3	28.3	11,8
Other chemicals	10.8	4.2	2.0	5.1	8,5
Man made fibres	0.0	*c*	*c*	2.7	1,9
Confidential (Total)	8.1	6.0	7.9		

[5] Such awareness is usually the result of a long term process, triggered by certain events, receiving a high public attention, e.g. through green pressure groups and the media. Differences in such awareness across European countries can for example be measured by market shares of "bio"-food or regular public surveys on ranking of issues that are of concern to the public. For example, the differences in environmental awareness are reflected in a Special Eurobarometer issue (No. 271, 2005) "Attitudes of European chitizens towards the environment" considering the frequency of efforts people make to protect the environment: "*Often*" was mentioned in Lithuania by 47%, Latvia 40%, Estonia 39%, and Poland 23%. In comparison: Finland 57%, Germany 53%, Denmark 49%, Sweden 41%.

The most significant market outside the European Union is for all countries the countries in Eastern Europe, the Caucasus and Central Asia (ECCAA).[6] Export to this area makes 11.5 to 29.3 % of the overall export. Apart from pharmaceuticals these exports also consist of detergents, paints and construction chemicals. One important issue for the new BSAP is therefore the question whether products of lower environmental quality are still exported from new EU member states to Russia, since these may eventually enter into the Baltic Sea from North-West Russia

Also Imports from the ECCAA region play a significant role compared to the overall imports from this region to EU 25. In particular Poland and Latvia seem to import significant amounts of chemicals from this region. Therefore, exporters of chemicals from Russia to the new EU member states may be a "natural" co-operation partner in gaining first practical experience with a system like REACH in Russia.

Table 3-5: Shares of imports from the following regions to the target countries (EUROSTAT, gross values, in %)

Region	Estonia	Latvia	Lithuania	Poland	EU 25 total
Total	100.0	100.0	100.0	100.0	100.0
From EFTA	1.3	1.1	2.8	2.3	3.9
From EECCA	1.7	7.8	2.3	4.3	0.4
From USA	1.3	9.0	1.9	4.1	9.5
From EU 25 (Extra)	6.5	12.7	11.2	16.4	20.7
From EU 25 (Intra)	93.5	87.3	88.8	83.6	79.3

Table 3-6: Shares of exports to the following regions from the target countries (EUROSTAT, gross values, in %)

Region	Estonia	Latvia	Lithuania	Poland	EU 25 total
Total	100.0	100.0	100.0	100.0	100.0
To EFTA	0.8	0.0	0.0	3.6	3.0
To EECCA	24.3	11.5	29.3	18.5	4.0
To USA	1.6	8.0	3.9	16.0	6.2
To EU 25 (Extra)	27.5	31.9	50.0	42.5	35.1
From EU 25 (Intra)	71.4	68.1	50.0	59.6	64.9

[6] Among the EECCA countries, Russia is the main trading partner for all countries.

4. Findings and proposed actions for the BSAP[7]

The HELCOM strategy[8] with regard to hazardous substances has set out the objective to reduce discharges, emissions and losses of hazardous substances towards the target of their cessation until 2020, with the ultimate aim of achieving concentrations in the environment near background values for naturally occurring substances and close to zero concentrations for man-made synthetic substances (HELCOM recommendation 19/5).

The strategy does not make specific reference as to whether implementation of EU and other international frameworks would reduce emission losses and discharges of hazardous into the Baltic Sea environment, towards meeting the objective by 2020. With, the mechanisms established under the Stockholm Convention, REACH having entered into force, with the priority setting under the Water Framework Directive, with the IPPC permitting system and the pesticide and biocide review programs (including authorisation mechanisms), an appropriate framework already exists at EU level to meet the HELCOM objective by 2020. These frameworks also include mechanisms based on which the HELCOM contracting parties can address the particular conditions in the Baltic Sea (compared to North Sea) with regard to potential impacts of emission, discharges, and losses of hazardous substances.[9]

However, the implementation of the requirements and the efficient use of existing instruments can still be improved on EU level, but also in the four new member states of concern. The following suggestions have been elaborated, based on the assumption, that it will be more effective to support the use of these existing mechanisms rather than running a HELCOM implementation structure in parallel. There is a suite of actions, the HELCOM contracting parties, and here in particular addressed are Poland and the three Baltic States, which they could collectively carry out in order to make better use of the EU frameworks for the protection of the marine environment. Most of these actions are required by EU legislation anyway and will therefore improve the policy performance balance as an EU member state.

4.1 Understanding of the Helcom Hazard Substance Concept

4.1.1 Criteria to determine hazardous substances

In the new members states a better understanding of the hazard concept as used on HELCOM and EU levels is needed. However the different legal frameworks use different terms, which does not ease the understanding among authorities and industry in the target countries, especially as in most of the national languages only one word is available and used for different purposes. International frameworks talk about:

- Dangerous = hazardous in normal use of language

7 The actions focus on new member states, for Russia there is a separate chapter 4

8 The Kalmar Communiqué of the Council of the Baltic Sea States, 1996, stated that the uncontrolled use and handling of chemicals, including pesticides, require special attention, and called for the development by the Helsinki Commission of an Action Programme to ensure that discharges, emissions and losses of hazardous substances will be continuously reduced, towards the target of their cessation within one generation, with the ultimate aim of achieving concentrations in the environment near background values for naturally occurring substances and close to zero concentrations for man-made synthetic substances

9 The lower water exchange rate and the larger population discharging into the Baltic Sea, combined with a lower temperature in the northern parts of the Baltic Sea and low vertical mixing due to salinity conditions requires a more conservative approach in identification of hazardous substances.

- The EU system for classification and labelling of chemicals uses the term „dangerous“ substance.
- The Globally Harmonised System (GHS) for classification and labelling uses the term „hazardous“ substance instead of “dangerous”
- In the context of OSPAR, HELCOM and the EU Water Framework Directive (WFD) “hazardous” indicates that the substance is likely to be persistent, liable to bio-accumulate and toxic (PBT), or is of an equal level of concern.
- In the EU BREF documents the terms “harmful” and “hazardous” are used in a general meaning.
- REACH introduces the concept of “substances of very high concern”, and defines PBT/vPvB as one type of such substances. Based on the marine chapter of the current Technical Guidance Document for Risk Assessment of Existing and New Substances (TGD,2004), Annex XIII of REACH defines numeric criteria for PBT/vPvB substances.

A harmonisation of terminology would contribute to a better understanding among all parties; however, it is not an action for the new member states only, but rather an initiative from all HELCOM contracting parties to be carried to the international forums.

In addition, the numerical values applied to determine whether a substance meets criteria of being on (very) high concern are slightly different under the different frameworks.

Table 4-1: Numeric criteria to determine Hazardous substances

	EU Danger. N; R 50/53	**EU PBT**	**EU vPvB**	**OSPAR Haz Sub**	**HELCOM WFD**
P	Not readily degradable	[Not inherently degradable][10] or $DT_{50,wat}$ > [60]40 d[11] $DT_{50,sedi}$> [180]120 d	[Not inherently degradable][12] or $DT_{50,water}$ > 60 d $DT_{50,sed}$ > 180 d	[Not inherently degradable] or DT_{50} > 50 days	The criteria are identical with the EU and OSPAR criteria, however numerical cut-offs have not been defined.
	Or	And	And		
B	Log P > 3 BCF > 100	[Log P > 4.5][13] BCF > 2000	[Log P > 5][14] BCF > 5000	[Log P > 4] BCF > 500	
	And	And			
T1	LC_{50} < 1 mg/l	[LC_{50} < 0.1 mg/l] NOEC < 0.01		[LC_{50} < 1mgf/l] NOEC < 0.1	
		Or			
T2	Not applicable	R45, R46. R60, R61,R62,R63 or T,R48 or Xi,R48		R45, R46 R60,R61,R62,R63 T,R48 or Xi,R48	
		Substance properties giving rise to an equivalent level of concern (e.g. occurrence of man made substances in the environment far distant from emission sources; indication of adverse effects in organisms not sufficiently reflected in standard testing) can be used to complement the criteria listed above.			

At EU level, action related to PBT (and vPvB) substances is justified with the concern that such may persist for a long time in the environment and may accumulate in biota, and that there is an unacceptable uncertainty to which extent they may cause adverse effects.

10 Data from screening test not foreseen for identification of substances of very high concern based on REACH Annex XIII)

11 These criteria refer to simulation tests on degradation under relevant freshwater conditions in water and sediments (40 and 120 days) or marine conditions (60 or 180 days). Marine conditions are characterised by slower degradation due to lower water temperature and lower density of bacteria.

12 See FN 9

13 See FN 9

14 See FN 9

The concerns connected to this type of substances can be summarised as follows (see current TGD II, section 4.4.1 related to the marine environment):[15]

- Hazardous substances may accumulate in parts of the environment,
  - whereas the effects of such accumulation are unpredictable in the long term
  - and such accumulation would be practically difficult to reverse as cessation of emission will not necessarily result in reduction of chemical concentration
- PBT or vPvB substances may have the potential to contaminate remote areas that should be protected from further contamination by hazardous substances resulting from human activity, because the intrinsic value of pristine environments should be protected;
- For substances which are very persistent and very bio-accumulative, high but unpredictable levels may be reached in wildlife or man over extended time periods. Toxic effects may be difficult to detect at early stage since they may only emerge over long-term exposure at usually low concentration and long life-cycles of species at the top of the trophic net. It is therefore recognized, that even toxicity has not been demonstrated in laboratory testing, and long-term effects can be anticipated.

For substances, which are persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB), conventional quantitative assessment methodologies are not appropriate to evaluate the level of risk they pose to man and the environment. No safe environmental concentration can be determined for these substances with sufficient reliability (see also REACH annex I, point 6.5).

The same concern is addressed under the Water Framework Directive (identification of priority hazardous substances) and will be addressed under REACH as well. In both, a set of criteria related to the inherent properties of substances is used to identify "hazardous" substances. The criteria and the assessment approach under REACH are not fully consistent with the criteria applied under the Marine Conventions and the marine risk assessment under current legislation:

- The Marine Conventions apply more protective cut-offs for bio-accumulation and toxicity. Compared to the EU PBT/vPvB criteria, the number of substances of very high concern is higher by the factor of 2[16].
- The Marine Convention and the marine risk assessment based on the current TGD foresee the use of screening data in the absence of simulations tests and BCF studies. Also this leads to a more protective approach.
- However the Marine Conventions do not foresee identification of hazardous substances based on information on persistency and bioaccumulation only. Compared to the EU PBT/vPvB candidate list, half of the substances of very high concern would not be caught by the regular criteria of the Marine Conventions[17] .

15 EC, 2004. Technical Guidance Document on Risk Assessment in Support of Commission Directive 93/57/EEC on Risk Assessment for New Notified Substances, Commission Regulation (EC) No. 1488/94 on Risk Assessment for Existing Substances, Directive 98/8/EC of the European Parliament and the Council Concerning the Placing of Biocidal Products on the Market, TGD, Part II. European Chemicals Bureau, Institute for Health and Consumer Protection.

16 See ratio between the number of substances on the OSPAR List of Substances of Possible Concern identified based on scenario I criteria (similar to EU PBT criteria) and Scenario III (BCF 500 and T_{acute} = 1 mg/l).

17 See EU PBT candidate list based on screening information (ECB, 2002)

Recommended Action	
1	The nature of substances covered under Recommendation 19/5 should be more clearly defined, in order to allow for targeted action. In the context of this study the phrase "substances of high environmental concern due to persistency and bioaccumulation" or "PBT-like substances" is used instead of "hazardous" substance.
2	In order to align the HELCOM Hazardous substance concept with current EU risk assessment practices, substances being of concern due to their high persistency and a high tendency to bio-accumulate (vPvB) should be addressed under HELCOM 19/5 regardless any available information on toxicity.
3	Based on their intimate knowledge of the Baltic Sea Environment, and their interest to protect the marine environment HELCOM contracting parties should identify substances which are not covered by the EU criteria but which nevertheless present an equivalent level of concern for the marine environment (action for all HELCOM contracting parties). This would include a thorough justification, preferably based on measured data from biota in the Baltic Sea. Such substances can be addressed through the EU frameworks (second priority list of the Water Framework Directive and Annex XV dossiers under REACH)
Actors	HELCOM bodies; Environmental Ministries of HELCOM Contracting parties; research institutions
Target group	Industry, public authorities [action 1]; EU fora responsible prioritising substances and launching regulatory action if needed
Time frame	short term (2008-2010)

4.1.2 Sources of hazardous substances

Site related sources and product related sources of emissions, discharges and losses of hazardous substances are equally addressed in HELCOM recommendation 19/5. However, both approaches have not yet been integrated into one consistent and effective strategy. Companies running IPPC installations can be emission sources of hazardous substances being contained in their raw materials. The experience from the present study, however, shows that most of the industrial end-users of chemical products do not systematically document the identity, the environmental hazard profile, the amount and the area of use of substances in their raw materials. In order to promote generation of knowledge on product sources at the ground level of the system, a number of actions are recommended in chapter 4.4.2.

4.1.3 Understanding the impacts

Furthermore, in the four new member states (as well as in Russia) the hazardous substance issue is not well known and understood in its full consequences for practical life of the public. Thus, there is no public debate and hence no reason for industry and authorities to allocate resources and to take action. In the EU-15 the public debate was very often a driving force for policy makers and authorities taking measures.

Recommended Action	
4	Initiate/support information campaigns addressing authorities, industry and societies in the new Member States (and Russia). The concern related to persistent and bio-accumulative substances should be explained in its consequence for practical life regarding present and future generations: Contamination of fish, contamination of human breast-milk; harmful effects related to the productivity and diversity of the Baltic Sea ecosystem. It would be the role of contracting parties to motivate and support stakeholder groups in placing the issue on the public agenda rather than running public campaigns themselves. Project of common public interest like e.g. "clean fish food from regional waters" or "responsible use of fire" may be suitable issues for public information campaigns.[see also 17]
Actors	Ministries of Environment and NGOs of the target countries
Target group	Public and municipalities of the target countries
Time frame	Short term (2008-2010)

4.2 Availability of information on single target substances

In the following chapter observations made during the present study regarding single target substances and their use in industrial processes in the new members states and, if available and comparable, Russia will be presented. At the end of the chapter some conclusions will be drawn and action recommended for decrease of uses.

4.2.1 Emission of Cadmium, mercury and dioxins

There are significant emission of dioxins, mercury and cadmium from point sources and diffuse sources in Poland and Russia, based on EPER data, EU inventory of dioxins and national reporting.

Table 4.2 provides an overview on the total national loads to air and water. To total riverine input as documented in the HELCOM Pollution Load Compilation [2] was 2.6 to 11.6 t/a total Hg between 1994 and 2004 (except for 1998 to 2000 with mercury peak loads from Poland). The total input for Cadmium was 23-52 t/a total in the years from 1996-2002. Except for Poland, where point source related emission data are available from EPER since 1994, the emission loads via water can hardly be traced back to the point sources. Also, the data based on river concentrations of mercury and cadmium is weak due to methodological problems. For all countries, there are conflicting or questionable data on the water side.

Table 4-2: Emission loads for Cd, Hg, (t/a) and Dioxins (g TEQ/a) (2004)

	Lithuania	Latvia	Estonia	Poland	Russia
Cd emission to water	0.01 [2] 1,416 [3]	3.02 [2,2003]	0.96 [2] 0.003	1.07 [2] EPER: 3.97 EPER: 1.94[18]	25.9 [2,2002] 0.33 [4]
Cd emission to air 2004	0,5 t [1] EPER: 0,017	0,5 t [1] EPER: -	0,6 t [1]) EPER: 0.52	44.9 t [1] EPER: 2.12 EPER: 3.2[19]	55.4 t [1]
Hg to emission to wa-	0.82 [2] 0,832 t [3]	0	3.86 [2] 0,0003	1.13 [2] EPER: 1,36	0.01 [2,2003] 0.01 [4]

[18] Polish Ministry of Environment 2007
[19] Polish Ministry of Environment 2007

	Lithuania	Latvia	Estonia	Poland	Russia
ter				EPER: 1.38[20]	
Hg emission to air 2004	0.4 [1]	0,03 [1]	0,5 [1] EPER: 0,5 t	19.8 [1] EPER: 0,26 EPER: 0.23	11.9 [1]
Dioxin emission to air 2004	No data	18g TEQ [1]	3.7g TEQ [1]	483g TEQ [1] EPER: 246 g TEQ[21]	655g TEQ [1]

[1] Meteorological Synthesizing Centre-East
http://www.msceast.org/countries/Latvia/index.html#poptrans: link for Latvia, but there are other countries too; back-calculation from 0.7-4.7 g/km^2/year Hg in NW Russia; back-calculation from6,9-22 g/km^2/y in NW Russia
[2]http://www.helcom.fi/environment2/ifs/ifs2005/en_GB/runoff/; all data 2004, except for Russia and Lithuania for Cadmium (2002) and Latvia and Russia for mercury (2003)
[3] Baltic Sea Environmental proceeding No. XX. Heavy Metal pollution to the Baltic Sea in 2004, DRAFT version, though, DATA ALREADY CONFIRMED by LIT MoE and Lithuanian Environmental Protection Agency
[4]- data from Neva-Ladoga Water Basin Administration, 2006.

The present study has its focus on the emissions from Poland since they form a significant share of the total load to the Baltic Sea, either via waste water discharge or as airborne deposition. The same applies for North-West Russia with regard to Dioxins and Cadmium[22], however the project team did not manage to identify the major sources of these loads since reports on emission sources are not publicly available and the holder of eventually existing heavy metal and dioxin emission inventories could not be traced[23].
The findings from the Polish monitoring program between 2002 and 2006 show that cadmium, nickel, lead and mercury can sporadically occur in a very high concentration. The maximum values were confirmed by relevant laboratories of State Environmental Inspection, although without giving the reasons. The results indicate that priority substances can be the serious problem in a local scale, but not at whole country level. However, any case of high concentration should be confirmed and the explanation for the situation should be given[24].

Compared to water emissions, the model based national reporting on air emission of Dioxins, Mercury and Cadmium allows to identify major sources and also to draw conclusions for measures to be taken. Based on the available information from Poland action related to mercury, cadmium and dioxin have been taken or should be taken on the following sources:

Dioxins
The contribution of non-industrial sources to the PCDD/F emission in Poland is very high. The reason for that is that the solid fuel consumption in the residential sector (hard coal and wood) is 20 times higher than average of EU-15[25]. Inappropriate management and treatment of waste accounts for about 30% of PCDD/PCDF emissions. Production sites in ferrous and non-ferrous metal production contribute 4.5% (ferrous) respectively 2.9% (non-ferrous), and lime production sites about 2.1%. The calculated figures from the national dioxin inventory do not match the data retrieved from the Polish EPER report (see table 9 in Polish Environmental Ministry 2007). Here cement industry and chemical industry are listed as major industrial sources.

20 Polish Ministry of Environment 2007
21 Ministry of Environment 2007
22 Highly conflicting data related to cadmium emissions via water
23 To be checked with RozTechNadzor
24 Chief Inspectorate for Environmental Protection, 2007
25 See Dioxin Inventory, Polish Ministry of Environment 2007; personal communication with Polish National Emission Center,2007

Mercury
The major source for air emission of mercury is burning of hard coal in the energy sector, in industrial heating, cement production, municipal and domestic heating. This is due to the mercury content of hard coal and the fact that de-dusting system as used in the energy sector and industrial burning processes do not effectively prevent emissions of mercury. Again, the EPER data do not match with the calculated inventory presented in *Polish Ministry of Environment, 2007.*

Emission of mercury to water from the two sites in Poland manufacturing chlorine based on mercury (capacity 180,000 t/a based on *MoE, 2007*) was about 225 kg in 2004. This makes an emission factor of 1.25 g/t. Surprisingly, according to EPER, there are two other industrial sites (Police SA and Boleslaw SA) with equal high or higher emission on the water pathway (132 kg respective 877 kg). The magnitude and source of this emission could not be traced back within project duration.

Cadmium
Hard coal is also the major source for cadmium emissions to air. However, in this case, industrial de-dusting systems work more effectively and hence domestic and municipal sources as well as agriculture, forestry and small industrial boilers are the most relevant sources. According to EPER, MITTAL STEEL is the largest single industrial source for Cadmium emission to air. A detailed comparison to BAT level is contained in Annex 5.

According to EPER, Boleslaw SA is also the major source for Cadmium emissions to water. The magnitude and source of this emission could not be traced back within project duration.

Recommended Action

5 Reduce dioxin and heavy metal emissions from private and municipal heating through an investment program to support the technical improvement (energy efficiency, temperature and oxygen conditions, low dust techniques, regular inspection by technical personal) of domestic and municipal heating. Set up a binding and enforceable norm for the maximum chlorine content in solid fuels for domestic heating (e.g. 0.1%). In long terms, this may also lead to a substitution of hard coal by other fuels.

Launch a public information and engagement campaign on “responsible use of fire”. This would include the communication and explanation of simple rules like: i) No waste burning in stoves, open fires or bonfires, ii) use dry and preferably hard-wood for heating and open fires, iii) operate stoves at optimal conditions. Such action would target about 47% of PCDD/PCDF emissions, 68% of Cadmium emissions to air and 10% of mercury emissions (Basis 2004).

Actors	Environmental ministries and municipalities in Poland
Target group	Industry sectors producing heating devices, local service companies, municipalities, private households
Time frame	long-term (2008-2018)

Recommended Action	
6	Reduce heavy metal emissions from the energy production sector and industrial burning processes through upgrading of dust cleaning installations and use low mercury hard coal or, in the long term, substitute hard coal by other energy sources.
Actors	Ministry of Environment, Ministry of Economy, Poland
Target group	Industry
Time frame	long-term: 2008-2018
Recommended Action	
7	Improve the management of landfills in order to prevent landfill fires. Such action would target about 22% of PCDD/PCDF emissions (Basis 2004). Prevent incineration of industrial waste without or with low efficiency gas cleaning systems. This would include improved supervision of waste stream by the authorities as well as bringing industrial waste incineration site in line with the requirements of the EU Directive on Waste Incineration.
Actors	Ministry of Environment and Inspectorates, Poland
Target group	Waste management sector
Time frame	medium term 2008-2012
Recommended Action	
8	Reduce cadmium and dioxin emissions from steel production by installing BAT. This should include Dioxin emission monitoring and additional dust/dioxin abatement systems (fabric filtration). Reduce dioxin emissions from secondary aluminium and copper production as well as lime production facilities by installing BAT.
Actors	Ministry of Environment and permitting authorities, Poland
Target group	Industry
Time frame	medium term 2008-2012

It can be assumed that that comparable action may be required in North West Russia, however a dioxin, cadmium and mercury inventory from Russia was not available for the present study.

4.2.2 Uses of single organic substances in products and processes

Uses of target substances for the present study were investigated based on product register information, permit screening (IPPC installation), internet screening (Russia) and interviews with companies. Table 4,3 gives an overview on the interviews carried out. Table 4-11 and 4-12 provide an overview on the permits screened during the study.

Table 4-3: Overview on empirical data in the study (Formulators, suppliers, users)

	Lithuania	Latvia	Estonia
No of suppliers (importers or formulators) identified related to the target products	43	20	20
Formulators in the countries in the figure above	25	10	10
No of users identified related to the target products		3	5
Companies contacted and interviewed • formulators • users	 8 0	 4 3	 4 3
Definite Information on use (or no use) of target substances received, including information on the source of information for the company	7	1	3[26]

For Poland and Russia, the approach based on personal contacts and direct company communication, like in Baltic States, doesn't work simply due to size of the countries: they are too large to get a representative sample. Existing personal contacts are not providing sound information. Nevertheless, in Russia interviews have been carried out with 5 companies for testing purpose (see table 5-3).

4.2.2.1 Status of marketing and use restriction at EU level

Many of the target substances have been banned or heavily restricted at EU level during the recent years. For these substances the focus within the BSAP should be on enforcing the marketing and use restrictions. For other substances, risk assessments (including PBT assessment) at community level are ongoing, and there is no final conclusion yet whether or not the substances need to be treated like PBTs or POPs in risk management. This for example applies to the brominated flame retardants (decBDPE and HBCD), and for the various use of medium chain chlorinated paraffins (MCCP). Table 4-4 provides a brief overview on marketing and use restrictions.

Table 4-4: Marketing and Use restrictions at EU level

Substance	Status of marketing and use restrictions	Reference
TBT and TPhT	Banned for biocidal uses since 2006	98/8/EC
PentaBDPE and OctaBDPE	Banned since 2004 in chemical products and articles > 0.1%	2003/11/EC
DecaBDPE	Banned in electric and electronic articles since 2006	2002/95/EC
Nonylphenol and Nonylphenolethoxilates	Banned since 2005 in chemical products > 0.1% ▪ Domestic cleaners ▪ Industrial and institutional cleaners (closed systems exempted) ▪ Textile and leather finishing (processes without releases to sewage system exempted) ▪ Pulp and paper agents ▪ Metal surface treatment (closed systems with incineration of residues exempted) ▪ Cosmetics and other personal care ▪ Emulsifier for veterinary products ▪ Co-formulant in PPP and biocides	2003/53/EC
Short chain chlorinated	Banned since 2004 in chemical products > 1% for	2002/45/EC

[26] Includes 2 paint manufacturers

Substance	Status of marketing and use restrictions	Reference
paraffin	▪ Metal working fluids ▪ Lat liquoring in leather finishing	
PFOS	Banned from 2008 in chemical products > 0.005% with a few exemptions related to ▪ Photographic industry ▪ Hydraulic systems in aviation ▪ ChromVI plating	
Cd	Banned with a few exemptions as ▪ colorant in PVC and paints ▪ stabilizer in PVC ▪ plating of metal surfaces ▪ portable batteries and accumulators > 0.002% (exemption for emergency and medical devices and cordless power tools) ▪ electric and electronic articles ▪ cars	1991/338/EEC 1907/2006/EC 2006/66/EC 2002/95/EC

This overview illustrates that enforcement and product control should be an important element of the BSAP. This applies in particular to imported articles (see action 15).

4.2.2.2 Substances in sewage treatment plants

Table 4-5 presents the findings from a one-off-survey in 25 Lithuanian waste water treatment plants compared with the findings from similar measurements in Finland, Sweden and Denmark.

Table 4-5: Concentration of hazardous substances in WWTP [HELCOM LAND 12/ 2007]

	µg/l in treated waste water in Lithuania	µg/kg (dw) in WWTP sludge in Lithuania	Comparison with range of findings from Sweden, Finland, Denmark
TBT	Not detected	4.3-53 (median 9.3)	10-100 (mean/median 9.3-44)
pentaBDPE		5.1-29.5 (3 WWTP)	81-150 (mean 60)
decaBDPE		293.–3,410 (2 WWTP)	5.6 – 1000 (mean 120)
HBCD			3.8-650 (mean 45)
NP	<0.01-1.8 (median 9)		0.03 – 5.5 (mean 0.3-0.5)
NPEO		0.4 – 95 (median 2.7)	1.7 – 437 (mean 2.8-88)

The comparison suggests that use of TBT, NP and NPEO in Lithuania does not significantly differ from the level and pattern of use in the Nordic countries. Whether this also applies to the other new EU member states cannot be concluded based on the available information. For brominated flame retardants, the situation is slightly different. The measured concentrations in sewage sludge in three Lithuanian WWTPs suggest the presence of local emission sources of decaBDPE. The source(s) have not yet been identified.

4.2.2.3 Nonylphenols and Nonylphenolethoxilates

Phasing out of NP/NPEOs and OP/OPEOs is progressing in all countries, often driven by suppliers of chemical products located in Western European countries. The marketing and use restrictions in the EU for certain product areas (since 2003) have triggered awareness also in other markets not directly targeted by the restrictions (e.g. the paint sector in Estonia).

The remaining concentration levels in waste water may be related to residual, not restricted uses, illegal uses and amounts imported in textiles from non-EU countries.

In the chemicals registers of Poland and Latvia the following amounts are reported: 12100 t for 2003 in Poland. About 68 preparations contained NP and 340 preparations contained NPE. The reported amounts for Latvia are about 2 t in 2004 and also in 2005 (car care products and construction chemicals). In addition, by permit screening NPE products have been identified in Estonian and Latvian leather industry. However, these permits were issued in 2003 and may not reflect the current state of production. Nevertheless, such cases illustrate that the permitting authorities in 2003 did not insist on BAT implementation regarding substitution.

4.2.2.4 BFR

For penta and octabromodiphenylether a total ban is in place at EU level since 2003. Preparations and Articles must be free of these substances down to a concentration of 0.1%. This concentration is far below any technical application of flame retardants.

The use of brominated flame retardants (including decaBDPE and HBCD) was not identified in any of the screened permits. Also, it was not reported in any of the registers. This may be explained by the following:

- BFR imported with articles do not need to be reported to registers and are usually not taken into account in environmental permitting;
- For DecaBDPE and HBCD there is no harmonised classification and labelling yet at EU level. Thus, suppliers of master batches or other flame retardant preparations are likely not to provide information on these components to their customers;
- Since these substances are not classified as dangerous, companies in the textile finishing and plastic conversion sector (e.g. polystyrene converters) may be unaware of the hazardousness of these products. In addition, plastic conversion is an activity that does not require an IPPC permit.

4.2.2.5 SCCP and MCCP

The only indication for use of short chain chlorinated paraffin is an entry in the Polish chemicals register (59 tons in 2003). However, in Russia SCCP seem to be in legal use (see Annex 8). In none of the screened IPPC and water permits SCCP was identified as substance of interest.

Different from that, significant uses of MCCP have been identified in polyurethane foams production in Estonia and in sealants production in Latvia. In both cases MCCP are used although the companies are aware of alternatives with better performance - but higher price. Both companies produce for the Russian market. In Poland, about 1100 tons were registered in 2003. A minor use was identified in the Estonian leather industry.

Table 4-6: MCCP case in Latvia

Sector	Production of construction and insulation materials
Amount used	530 to 929 t in 2005 according to product register (HELCOM Land, 2007)
Target products	3 products – sealants (water proof insulation products)
Function of MCCP in product	MCCPs are used as plasticizers starting from 5 up to 24% concentration in product
Use of products	In construction and building industry: • in bathrooms; • for windows • for wooden parts • for any other material
Import of substance	• approx 1/7 is imported from Russia • approx 6/7 are imported from Western Europe
Export of products	• CIS, Common wealth of Independent States
Substitution plans	• No • Alternatives have been considered, however the determining factor price has lead to choice of MCCP

Table 4-7: MCCP case Estonia

Sector	Production of construction and insulation materials
Amount	950 tons in 2005 based on information from companies
Target products	2 companies, both with 2 products exported outside EU: single component polyurethane foams
Function of MCCP in product	MCCPs are used as fillers, also acting marginally as plasticizer. Content 5 % up to 15 % of overall canned product;
Use of products	Construction activities: • Mounting window- and doorframes • Filling of cavities • Sealing of openings in roof constructions and insulation materials • Creating a soundproof screens • Filling of cavities around pipes • Fixing and insulating of wall panels, roof tiles, etc.
Import of substance	• 100 % imported from Western Europe
Export of products	• Common wealth of Independent States, Turkey; Approximately up to 15 000 tons of MCCP foams annually
Substitution plans	• No • Alternative is TCCP (tris-2-chloroiso-propylphosphate), however the determining factor – competitive price - has lead to choice of MCCP, although TCCP exhibits much better performance

4.2.2.6 PFOS substances

Information on PFOS and PFOS related substances is hardly available at all. Except for a minor use of PFOA in an Estonian metal processing enterprise and the identification of one supplier in Russia (see Annex 8) no further information could be obtained during the present study.

4.2.2.7 Endosulphane and TBT

TBT and TPhT are being phased out and hence the concentration still found in municipal waste water all over Europe are remains of past production and use. Ship yards may be still an actual source due to the removal of coatings in maintenance and repair of ships.

Residual uses of Endosulphane, TBT and Nonylphenolethoxilates as co-formulant have been identified in Poland. However, a complete phase out is likely since the substance are/will not be authorized as active ingredient at EU level. TBT and NP/NPEO are also banned.

Table 4-8: Substances in registered Pesticide and /Biocide products

	Lithuania	Latvia	Estonia	Poland	Russia
TBT	No/No	No/No	No/No	No/Yes	No/No
TPhT	No/No	No/No	No/No	No/No	No/No
Endosulphane	No/No	No/No	No/No	Yes/Yes	No/No
NP	No/No	No/No	No/No	Yes/Yes[27]	No/No

4.2.2.8 Cadmium

No use of Cadmium has been identified in the present study. However, a producer of Cadmium containing products in Russia has been identified selling his products in applications that are banned on the EU market (paints, plating). Also, Cadmium is added to copper in wire production to improve the mechanical properties of the wire (Source of information see Annex 5).

Recommended Action	
9	Particular action is proposed related to the use of MCCPs in isolation foams and sealants. The cases in Estonia and Latvia suggest that there is a significant mass flow of MCCP from a few substance manufacturers in old EU via formulators in the new EU Member States to the Russian market. This trend seems to be driven by comparable low prices of MCCP, but not necessarily its technical performance in these applications. The action should aim to substitute MCCPs and may include the following elements: Inform the respective formulators on the results of the EU Risk Assessment and the state of discussion in the PBT assessment group of the EU member states related to MCCP; launch a project on comparative cost-benefit-analysis related to available alternatives in co-operation with the concerned companies; carry out a market analysis in North-West Russia to explore the potential demand for more environmentally sound building and construction chemicals;
Actors	Ministry of Environment in Cooperation with Ministry of Economy of Estonia and Latvia
Target group	Manufactures of building and construction chemicals
Time frame	Short : (2008-2010)

[27] For NPE

Recommended Action	
10	Carry out screening measurements in WWTP related to brominated flame retardants in Latvia, Estonia, and Poland. In case of significantly increased levels, search for local emission sources (e.g. textile finishing companies, plastic converters, waste treatment). If sources identified, support companies to comply with EU legislation: cease use of pentaBDPE and octaBDPE containing products; apply BAT regarding use of decaBDPE and HBCD in processing; switch to (less hazardous) substitutes in order to improve the environmental performance of the corresponding products
Actors	Ministries of Environment of EE, LV, PL, NW RU
Target group	Sewage treatment sector and companies discharging waste water into the public system
Time frame	short-term: (2008-2009)

4.3 Information from substance/product registration systems

A systematic basis for reporting on uses and emission of single hazardous substances does not exist in the new member states for different reasons:

- no limit values are indicated in permits and thus no monitoring is taking place,
- insufficient quality of SDS (originated from many suppliers world-wide) and consequently large information gaps in the companies' inventories,
- Shortcomings in existing product registers as follows:

Poland and Latvia have established a product register, and Estonia is going to do the same. Product registers can be a useful instrument for better targeting chemicals policy and to support the implementation of REACH on the national level. However, if such a register is set up, proper design (e.g. functioning updating mechanisms, identification of manufacturers and importers possible), sufficient evaluation capacity (e.g. making the information form SDS accessible in electronic format; checking the SDS information for correctness) and a well-defined role in the national system on chemicals control is needed. Otherwise operating such a system is wasting resources and may even lead to misinformation. Once the eSDS under REACH will become available, systematic analysis of SDS in a product register system will allow identifying products that are likely to contribute to emission, losses and discharges of hazardous substances.

Table 4-9: Chemicals registration systems[28]

Type of info	Lithuania	Latvia	Estonia	Poland	Russia
Identity of substances produced or imported into country	YES	YES	YES[29]	YES	YES[30]
Identity of importer	NO	YES	YES	YES	NO
Volume of substance	YES	YES	YES	YES	NO
Intended Use of substances	YES	YES	YES	NO	NO
Identity of preparations imported or produced	YES	YES	YES[5]	YES	YES*[31]
Identity of importer	NO	YES	YES	YES	YES*
Full composition with/without per-cent	YES	YES	NO	YES	NO
Identity of single dangerous sub-stances contained, with or without (%)	YES[32]	YES	YES	YES	YES*
SDS	NO	NO	YES[33]	YES	YES*
Volume per company	YES	YES	NO	NO	NO
Information on intended Use	YES	YES	YES	YES	NO
Does register reflect actual mar-ket situation	YES	YES	NO	NO	NO
How many substances and/or products in the register	3,458[34] sub-stances 671 preparations	3,284[35]	969 sub-stances	30,000	> 2000
Are only dangerous preparations or all preparations registered.	All	All	Dangerous to humans	dangerous	
All state authorities concerned with health, environment , econ-omy have access	YES	YES	YES	NO[36]	NO

28 Overview does not include notification of substances placed on the market for first time

29 Registration of existing (EINECS) substances produced or imported to Estonia over 10 t/year

30 Register of Potentially Dangerous Substances

31 * A register of Safety Data Sheets exists (about 10,000 entries) however the market coverage is quite low since i) the register has no clearly defined role in the system, and ii) the duty to provide safety data sheets is also not adequately defined in the leg-islation.

32 to be confirmed by Lithuanian register

33 SDS shall be submitted for each chemical being classified to have health hazards

34 reflects present market situation

35 reflects present market situation

36 The Bureau for Chemical Substances and Preparations claims to be obliged to provide detailed data only to medical and emergency services.

Recommended Action	
11	The product registers in Poland and Latvia were a valuable source of information for tracing substances of concern. Latvia, Lithuania and Poland as countries running already a product register should decide which role it shall play under the REACH system. For substances, there will be a central register at EU level, also including volume bands and general information on the uses of substances. However, this register will not include information on uses of chemical products (preparations). A national product register can be a valuable tool to complement REACH and to support the enforcement of REACH. However, it binds resources and needs proper enforcement.
Actors	Responsible Ministries and Agencies in LV, PL
Target group	Government
Time frame	Short term 2008-2009

4.4 Implementation of existing legislation

Different from the old EU member states, especially the Nordic countries, specific legislation targeting chemical substances of environmental concern has not been a tradition in the new member states. Such policy elements have been mainly introduced into national legislation with the transposed EU frameworks such as the Water Framework Directive, IPPC Directive, Biocide Directive, Marketing and Use Restriction Directive etc. The requirements are still relatively new for the multitude of involved authorities as well as for industry in the new member states. Permitting authorities, enforcement authorities and state institution managing information with regard to use, emission and exposure to chemicals have been partly re-organised or newly established in parallel to a large variety of new legislation to be implemented. Also, the discussion on the REACH regulation has created more awareness; however, it is still far from being sufficient to properly control and eliminate emission, discharges and losses of environmentally hazardous substances in the countries.

The main problem is the lack of orders, by-laws and/or guidance documents following the primary legislation (which is in place) to facilitate its implementation. In consequence, authorities and industry lack guidance for correct implementation of the legislation. Also, implementation of different pieces of legislation related to hazardous substances is not well interconnected due to the lack of inter-institutional co-operation. In the following chapters, a number of actions are proposed to eliminate relevant gaps in implementation of existing legislation.

4.4.1 Priority hazardous substances under the WFD

The process towards measures related to priority substances under the WFD appears to be slow, at national level and at EU level. Six years after adoption of the Parliament and Council Decision on establishing a list of priority substances in the field of water policy (2455/2001/EC), water authorities in Estonia, Latvia, and Poland have not yet started a systematic *source and pressure analysis* related to these substances. Only Lithuania has started to screen effluents from municipal and industrial waste water (as well as sewage sludge, receiving waters and sediment in the receiving environment) in a one-off survey with Finnish assistance. However also here, like in the other countries, source analysis did not address yet chemicals at all. Identifying further priority substances at national (river basin) level, as foreseen under EU WFD has not yet taken place. Also, setting up a second EU wide priority list has only recently started at EU level. In this way, the time frame of the WFD implementation regarding priority hazardous substances more and more disconnects from the 2020 target of HELCOM Recommendation 19/5.
Table 8 provides an overview on the status of WFD priority substances in national water policy. The table refers to the subset of priority substances covered in the present study.

Table 4-10: WFD priority substances (2001) addressed in national legislation or action programs

	Lithuania	Latvia	Estonia	Poland
EQS established for	Cd, Hg, TBT, NP, NPE, PeBDPE Endosulphane	Cd Hg	Cd, Hg.,TBT, ThPT,xBDPE NP, OP, SCCP Endosulphane	Cd,, Hg, Endosulphane
Emission limit values	Cd, Hg, TBT PeBDPE NP, (NPE)	Cd Hg	Cd, Hg PCDD/F	Cd,, Hg, TBT,PCDD/F
Regular surface water monitoring	Cd,Hg, Endosulphane,	Cd, Hg	Cd, Hg	Cd,, Hg, Endosulfane
One off survey related to WFD priority sub-stances	Performed[37]	not performed	Not performed	Not performed[38]
Source and pres-sure analysis	not yet	Not yet	Not yet	Not yet

Recommended Action

12 With a view to the 2020 commitment under HELCOM, the four new EU member states would be well advised to start the pressure and source analysis related to the EU list of priority substances as soon as possible (not waiting for final agreement on "hazard" status or EQS at EU level. In this work, other substances of high concern for the water environment identified by HELCOM could be included as national priority substances. A one-off screening of waste water discharges (as carried out in Lithuania) as well as surveys of chemical products or information from existing product registers is suitable instruments to start this work. The pressure and source analysis should always result in a conclusion whether national action is needed going beyond enforcing i) the existing marketing and use restrictions and ii) implementing BAT in the IPPC permitting system

Actors	Ministry of Environment and regional water authorities, waste water companies, in co-operation with Environmental inspectorates in EE, LV, LT and PL
Target group	Public policy
Time frame	short term (2008-2010)

4.4.2 Environmental permitting

4.4.2.1 Overall characterisation of present practice

Industrial production processes account for a considerable share of the overall pollution in Europe, and the EU has a set of common rules for permitting and controlling industrial installations with major polluting potential laid down the IPPC Directive of 1996. For other installations (non-IPPC) the basis of environmental permitting is regulated in the national legislation taking into account the EU legislations on water, waste and air pollution, however the Member States have diverse practices.

[37] (Source – HS found in LT wastewater/sewage sludge or receiving environment according to Finnish and Lithuanian Environmental Agency "Report on dangerous substances in the aquatic enironment of Lithuania")

[38] Results were presented in: 1. International Report from Oder Basin district - report for UE Com-mission 2005: no in-formation from polish part of international Odra basin district and 2. Report for Vistula Basin district 2005: No information about haz-ardous substances, only metals.

In essence, the IPPC Directive is about minimising pollution from various industrial sources throughout the European Union, and to ensure a high level of protection of the environment taken as a whole. The IPPC Directive is based on several principles, namely (1) an integrated approach, (2) best available techniques, (3) flexibility, and (4) public participation.

The permit conditions, including emission limit values (ELVs) must be based on Best Available Techniques (BAT), as defined in the IPPC Directive. To assist the licensing authorities and companies to determine BAT, the Commission has adopted BAT Reference Documents (BREFs), which are guidance documents on the selection of techniques and assigning ELVs for pollutants associated with certain installations. Flexibility in determining permit conditions allows the licensing authorities to take into account: a) the technical characteristics of the installation, b) its geographical location, and c) the local environmental conditions.

New installations, and existing installations which are subject to "substantial changes", have been required to meet the requirements of the IPPC Directive since 30 October 1999. Other existing installations must be brought into compliance by 30 October 2007[39]. This is the key deadline for the full implementation of the Directive.

It must be noted that BAT is however not a fixed technical standard for a certain industrial process, but part of a broader concept towards a common approach to pollution prevention and control in Europe:

- It is a dynamic concept which develops over time; this means that adapting to BAT requirements is a continuous process;
- Although BREFs are not legally binding in determining specific technique nor ELVs, substances associated with certain types of activities shall be considered in a permit application and in permit conditions. This includes: establishing an appropriate monitoring programme (either by direct measurements or calculation by process data)[40]; actual emissions of these pollutants are reported to EPER registry if annual emission load is above assigned reporting threshold values;
- ELVs provided by EU directives shall be considered as minimum requirements, better performance of an installation should be aimed while establishing pollution prevention and control targets.

Compared to that, the current practise in addressing environmentally hazardous substances in the environmental permitting system can be characterised as follows.

- There is sufficient general legal basis to regulate hazardous substances in environmental permits (IPPC permits, wastewater discharge permits).
- The criteria and methodology to identify substances requiring in-depth-evaluation before granting a permit are not sufficiently worked out. This is related to both, the understanding of the concern related to persistent and bioaccumulative substances and a workable methodology to identify sources of such substances in i) the input material or ii) certain process steps, and to evaluate the fate of such substances in the technical process down to the emissions and product output.
- The burden on permitting authorities is quite high, i.e. there is no capacity for in-depth investigations in a single company. Thus, the quality of permits is directly related to quality of applications.
- The expertise of consultants assisting companies and permitting authorities is usually quite low regarding the hazardous substance issue.

39 Poland was granted 3 years derogation period for some installations to achieve BAT

40 Commission Decision of 17 July 2000 on the implementation of a European pollutant emission register (EPER) according to article 15 of Council Directive 96/61/EC concerning integrated pollution prevention and control (IPPC) 2000/479/EC; Guidance mentioned in Article 3(2) is available at http://ec.europa.eu/environment/ippc/eper/index.htm

- Industries discharging into municipal sewery are not subject to environmental permitting. At present, no systematic identification of environmentally hazardous substances from these sectors and companies take place. .

Quality of IPPC permits with regard to reflecting use of hazardous substances is diverse: some permits contain long list of substances, including those in preparations, in some cases hazardous preparations are grouped not indicating hazardous substances in them, in some cases the tables to list the raw material input in the permits are simply empty.

Further, even if hazardous substances are listed at the input side, the information is usually not reflected at water discharge side, unless the substance is specifically mentioned in the national legislation or the BREFs, and an emission limit value and/or an environmental quality standard exists. Except for Mercury and Cadmium, such EQS for priority substances under WFD have only recently been introduced in Lithuania and Estonia. This is not the case yet in Latvia and Poland.

4.4.2.2 Results from screening of permits

In practice, hazardous substances are not well-addressed in IPPC and water permitting systems in the new member states. The project has assessed approximately 100 permits for the target industrial sectors in all four new member states, and concludes that the demands of the IPPC Directive to address hazardous substances as listed in the WFD (Annex 8) are not fulfilled.

Table 4-11: Overview on empirical data in the study (IPPC permits[41] or chemicals users)

	Lithuania	Latvia	Estonia	Poland
Total number of IPPC issued	159	83	20	1471[42]
Number of permits/installations in target sectors[43]	7	8	14	272
Total number of IPPC permits checked	7	8	20	27
Total number of non IPPC permits checked	0	25	10	0
No of companies characterised regarding use of hazardous substances and measures to prevent emissions (substitution, pollution control measures); compared with BAT standard in a wider sense, based on in depth analysis	No	15	13	?

41 = includes permit application, permit itself and conditions set in the condition
42 without life-stock
43 see next table;

Table 4-12: Permits checked by sector or type of installation[44]

	Lithuania	Latvia	Estonia	Poland
Total permits screened	7	33	30	27
Textile finishing	2	1	1	2
Producing paper and board	3		2	2
Steel	1	1	1	2
Cable coating	1		1	
Metal finishing		19		4
Leather		4		
Chemicals industry		7	3[45]	13[46]
Shipyards		1	2	
Smelters				3
Cement plant/Mill				1
Manufacturing of plastic products			2	
Municipal waste water discharge			9	
Tannery			1	
Electroplating			2	
Non-target-sectors			6	

Table 4-13: Results of permit screening (information content in ... of the sample)[47]

	Lithuania	Latvia	Estonia	Poland
Total permits screened	7	33	20	27
Inventory (present in the application or part of conditions)	7	32	20	21
Is it possible to identify environmentally hazardous raw material from the inventory	PARTLY	PARTLY	5	21
Have environmentally hazardous substance been identified in the permit	NO[48]	PARTLY[49]	4	12
Particular (environmentally hazardous) single substances addressed in the permit • Emission limit or • Control measures • Substitution	NO[50] NO NO	NO[51] NO 4 permits	7	General statements only

44 for details see Annex 3
45 Including paint manufacturing
46 In Poland the figure includes cable coating, rubber and plastics, fertilizer, pesticides and biocides)
47 For details see Annex 3
48 Preparations listed, but no Hazardous constituents indicated
49 Where only preparations are listed – it is not possible, where substances are listed – yes, some environment hazardous substances are identified. Permit requires to identify substances or preparation. 2 of Helcom substances identified – MCCPs and Nonylphenols according to CAS numbers in substance and preparations. However it is not possible to relate substances to the processes in which they might be used)
50 for metals only
51 for metals only

	Lithuania	Latvia	Estonia	Poland
Particular (environmentally hazardous) preparation types addressed in the permit • Emission limit or • Control measures • Substitution	 NO NO NO	 NO NO NO	 NO NO NO	General statement only
Action plan with regard to environmentally hazardous substances	NO	1 permit	NO	NO

In most cases the requirement for a "chemicals inventory" is the most specific demand to companies with regard to hazardous substances. Reason for this incompliance is largely due to the lack of training among all involved stakeholders (permitting authorities, external experts and permit-receiving companies) and guidance from the national authorities. As already mentioned above, the primary legal basis exists, but there is a lack of by-laws, orders, guidelines to ease implementation.

Recommended Action

13 Development of technical guidance (national languages, but recommended to join efforts among the four countries with one template, e.g. developed in frame of a joint project) for IPPC permits addressing the hazardous substances in details (for instance, obligatory screening for hazardous substances in the input of an installation and obligatory screening of waste water e.g. based on the WEA methodology); Implementing a series of training courses for authorities and companies (joint template recommended, possible to be developed in a joint project). For more details, see chapter 4.4.2.3.

Actors	MoE and permitting authorities in EE, LV, LT, PL
Target group	Permitting authorities and industry
Time frame	medium term (2008-2012)

Based on the EU IPPC Directive and the BREF documents for some sectors, identification and minimisation of PBT-like substances in raw materials, and in emission, discharges and waste of production sites can be regarded as BAT. However, not all BREF documents address the hazardous substances and define BAT. Nevertheless, we can state from screening of the permits that no measures related to BAT requirements particularly addressing hazardous substances are found as demand towards the enterprises in the new member state. An obvious reason for this is the large volume of the BREF documents and the efforts it needs to extract from them concrete guidance on BAT for hazardous substances.

Recommended Action

14 National legislation should be amended stating clearly requirements with regard to the substances of concern. In those sectors, where the BREF documents explicitly require substitution, a qualified substitution statement should be part of the permit application. It would be recommended to elaborate a reference list for BREF documents where to find requirements on the substances (for more details see following chapter 4.4.2.3)

Actors	MoE and permitting authorities in EE, LV, LT, PL
Target group	Government
Time frame	Short term (2008-2009)

Hazardous substances are not only used in enterprises that require an IPPC permit due to the size of the installation, but also in smaller scale enterprises. Furthermore it is common practice in companies, not only in new member states, to split their installation into several legal

entities trying to avoid an IPPC permit. This means that IPPC permits may not be the only instrument reducing emissions of the hazardous substances, as only a few companies, especially in the Baltic States, fall under IPPC.

However, also non-IPPC companies need to apply for a water permit for discharges. A screening requirement for "hazardous substances input" can be introduced in this permitting procedure, as water permitting system does not address hazardous substances used, although the requirement to address them in discharges is legally adopted. The additional burden to companies would be limited since an inventory of dangerous chemicals is required anyway under the legislation related to occupational health and safety, and also to dangerous sites.

Furthermore, there are a large number of companies, belonging to the target sectors of the project, discharging their wastewater to the municipal sewer. In this case there is no wastewater discharge permit, and the control over hazardous substance discharge could be done only by contractual agreement on conditions between an enterprise and an operator of the common sewer.

4.4.2.3 Proposed elements of a technical guideline for IPPC installations

The proposed action is i) to better define legal duties (e.g. by amending the national legislation) and ii) to draft technical guidelines to companies and permitting authorities on how to carry out a site specific assessment on integrated pollution prevention and control with regard to substances of particular environmental concern[52]. This should include guidance to municipal waste water treatment companies and/or municipal authorities on how to prevent environmentally hazardous substances to be discharged into the public sewer system. The guidance should be limited to raw materials as a source of emission and discharges of hazardous substances to the environment.

A. Reference list of substances of high environmental concern[53]

In order to facilitate a harmonised approach in targeting environmentally hazardous substances, a reference list of such substances should be established and regularly applied in permitting. It would be the duty of the applicant to make a formal statement that i) the substances on the list are not used and/or generated during the processes, and ii) if they are used/generated that there is no release to the environment[54]. If the applicant cannot make such statement, he would be obliged to demonstrate in the application, that the substance cannot be replaced by a less hazardous substance and that all BAT measures have been taken to minimise emissions to the environment on all relevant pathways (including sludge from sewage treatment). The reference list should be built on the following elements (partly overlapping):

- EU list of priority substances under the Water Framework Directive (except plant protection products)

52 Substances being persistent, bioaccumulative and toxic, or posing an equal level of concern, by their intrinsic properties.

53 In the current study, HELCOM "Hazardous Substances" are addressed as substances of "high environmental concern due to their intrinsic persistence, liability to bioaccumulate and/or high toxicity". This is to avoid confusion related to the term "hazardous" which has a much broader meaning in other frameworks. The reference list operationalises Annex II of the IPPC Directive with regard to the following substance groups: 4 and 5, 3,7,8 via water and 5, 13 via air.

54 For naturally occurring substances, impurities of PBT/vPvB substances in raw materials or emissions of hazardous substances formed in technical processes (PCDD and PCDF) the guidance should include cut-offs, below a substance is regarded as not emitted (detection limit based on standardised analytical methods) or not to be assessed when contained in a raw material (e.g. 0.1% for organic, non CMR or sensitising substances).

- List of POPs under the Stockholm Convention
- List of substances banned for marketing and use in the EU based on environmental concerns
- EU list of PBTs and vPvBs as assessed under the EU Existing Substance Program
- Substances with harmonised classification R50/53 according to Annex 1 of the current Directive 67/548.
- Additional substances having been assessed to be of priority concern[55] under HELCOM recommendation 19/5 or the OSPAR Hazardous Substance Strategy

From 2009/2010 such list needs to be updated with information from the EU List of substances of very high concerns (established under article 59 of REACH), the EU classification and labelling inventory under REACH and the second list of priority substances under the WFD.

B. Duty to carry out investigation

In order to fulfil his duty under IPPC legislation the applicant should be obliged to carry out investigations to identify environmentally dangerous substances (including those of high environmental concern) in his raw materials. This regards relevant impurities in raw materials as well as components in preparation he buys from his suppliers. The applicant should ask his suppliers to identify all environmentally dangerous substances (according to the classification rules under Directive 67/548) above 1% [0.1% under REACH] with their CAS and EINECS numbers in the safety data sheet supplied with the preparation. Based on this information the applicant can draw up an inventory, including substance identities, amounts and pathways through the production process. The volumes of substances contained in more than one input material can be summed up. The applicant should be also obliged to include i) a prediction of emissions via air, water and waste into his application and ii) a justification why further reduction of emissions is not possible[56] or not needed based on exposure and risk considerations. Quantitative exposure and risk considerations would be only relevant for substances on the reference list that are not classified as PBT, vPvB or POPs.

C. Assessing implementation of BAT by the permitting authorities

It would be the task of the permitting authorities to evaluate whether the argumentation of the applicant is convincing and well documented. For this, the authorities need criteria and guidelines, e.g.

- Criteria for assessment of relevance for each substance or substance groups taking into account that final recipient is the Baltic Sea.
- Emission limit values or control measures or any other permit conditions (e.g. substitution) and foresee appropriate monitoring mechanisms
- Examples, on extent of information to be presented in the application, how to perform concentration / load calculations, how to set limit values or other appropriate permit condition, including substitution.

D. Non-IPPC permits and discharges into the public sewage system

Action should not be limited to permitting of IPPC sites, since also smaller installation belonging to the sectors listed in Annex I of the IPPC Directive or types of activities not falling under IPPC at all (e.g. plastic converters) can be a relevant sources of emission, losses and dis-

[55] In depth assessment providing evidence for the concern has been carried out and agreed under HELCOM.

[56] based on technical and economical considerations, taking into account the relevant BREF document

charges of environmentally hazardous substances. However, the requirements to the applicant must be more limited - simply for reasons of practicability, and there should be a cut-off releasing micro companies from the duties listed below. The cut-off can be based on a number of employees [e.g. 20], the amount of chemicals used [e.g. 0.1 t/a per product without fuels] or the amount of waste water discharged [e.g. …]. For the non-IPPC and non-micro companies, the following legal duties should be established and enforced:

- Setting up an inventory of all environmentally dangerous substances based on the information in the safety data sheets received from suppliers. The inventory should include information on the volumes of the substance applied and the likely percentage discharged via waste water. This inventory should be part of the documents required to apply for a waste water discharge permit [duty in principal identical with IPPC companies].
- Obtaining an official confirmation from all suppliers of substances and preparations that the substances on the reference list of substances of high environmental concern are not contained in the products supplied (threshold 0.1%). It should be the duty of the company to have such conformation available for each chemical product used in amounts above threshold.

4.4.3 Market surveillance

During the past years, for a number of HELCOM "hazardous" substances marketing and use restrictions have been imposed on EU level (e.g. NP, SCCP, octa and penta BDPEs, Pb, Cd, Hg, organotin compounds). Enforcement of these restrictions depends on the market surveillance bodies and inspection strategies in the EU member states. Surveillance of documents and labels, as currently undertaken in the new member states, is important but not sufficient:

- Currently 650 to 2500[57] chemical (non cosmetic) products are checked per year: the rate of incompliance related to classification, labelling and SDS is 20-40%;
- Only few (up to 100) products are checked analytically in Estonia and Poland; such checks are not at all performed in Lithuania and Latvia;

Table 4-14: Market surveillance

	Lithuania	Latvia	Estonia	Poland
Total number of chemical products on the market	3,458[58]!	3,284	Not registered	30,000
Cosmetics in this	N/A	0	-	N/A
Biocide in this	N/A	0	-	N/A
Pesticides in this	N/A	0	-	818
Total Number of products checked per year	4635[59]	1200	2527	2,395[60] 776[61]
Rate if incompliance	26 %	35 %	17-24 %	(SSI: 18%). [62] TI: 32,3%
Number of products checked with analytical means with regard to restricted substances	0	0	No info	TI: 51

57 to be confirmed with information from Poland.
58 Data from the Dangerous chemical substances' and preparations register and Environmental Protection Agency (Inconsistencies in the data are likely, however no other formal source can be obtained at present, May 2007.
59 Data from 2006; about 3,160 of this are cosmetic and biocide products.
60 Data from September 2007.
61 Data from August 2007.
62 The rate of incompliance is related to the total number of entities checked, not products. In 2006 out of 19,650 checked 3,563 entities were indicated as incompliant.

	Lithuania	Latvia	Estonia	Poland
Rate of incompliance	N/A	N/A	N/A	TI: 14%

Recommended Action	
15 Strengthen market surveillance capacity and strategies, in particular analytical product checks – including resource allocation and staff training. Exchange of experience with market surveillance bodies in other EU countries.	
Actors	Government and market surveillance bodies in EE, LV, LT, PL
Target group	Trade and industry
Time frame	medium term 2008-2012

4.4.4 Prepare for REACH implementation

Under REACH, for each substance >10 t/a an assessment related to intrinsic PBT/vPvB properties has to be carried out by the manufacturer and /or importer. If the criteria for concern are met, an emission minimisation strategy has to be worked out by the manufacturer and importer. The manufacturer or importer and his direct customers are obliged to communicate both, results of this safety assessment further down the supply chain. Thus, conceptually REACH can solve the present problems with regard to availability of information and proper risk management.

Recommended Action	
16 Set up a support and enforcement structure for REACH to be operational from 2009. This includes in particular capacities to help industry to implement the new requirements related to the safety data sheet system (exposure scenarios) and notification of articles containing substances of very high concern. This includes the information mechanisms related to persistency, toxicity and bioaccumulation of substances (PBT assessment). Proper implementation of i) the PBT assessment and information mechanisms and ii) the exposure scenario mechanisms of REACH is considered to be the most systematic way to achieve the HELCOM 2020 target.	
Actors	Competent authority for REACH, national help desk, product inspectorates, environment and health inspectorates in EE, LV, LT, PL
Target group	Trade and industry
Time frame	medium term (2008-2012)

4.5 Promote public interest and access to existing information

Without the public becoming interested in the implementation of the hazardous substance strategy, it is likely that HELCOM will fail to meet its objective. Without sufficient and stable awareness, neither the authorities nor industry will manage to allocate sufficient resources to the issue. Currently, the benefits of meeting the objective in 2020 are not well explained to people outside the circles that invented the objective. The present project clearly illustrates the difficulties to identify the existence of information and to get access.

Recommended Action	
17	It would be therefore a useful investment of the HELCOM contracting parties to support the development and implementation of a communication program on why the 2020 objective is important, how consumers, services, trade and industry would benefit and what the consequences are if policy fails to meet the objective. Such action should be based on a project of common interest like for example “clean fish food from local waters” or “responsible use of fire”.
Actors	Environmental ministries and municipal authorities
Target group	Concerned trade and industry organisations, local service companies, municipalities, private households
Time frame	medium term (2008-2012)

5. Findings and proposed actions within the BSAP (Russia)

The analysis of the Russian situation was separated in this report from the other target countries due to significant differences in the legislative basis (not being an EU member) and in order to ensure an individual approach, guaranteeing specifically tailored recommendations.

Abbreviations used in the text are explained in Annex 7.

5.1 Understanding of the concern related to Hazardous Substances

In Russia, hazardous properties of a substance are mostly understood as **high toxicity to humans**. Other considerations, like chronic environmental hazards, in particular accumulation of substances in biota, including humans **are not widely accepted as a reason for immediate actions.** As Russia is not bound to legal requirements from the EU legislative frameworks, substances which are causing long term effects in the environment or via the environment to humans, but which do not show very high acute toxicity to humans, are not really addressed in policy and legislation. One of the consequences is the absence of measured data from environmental media related to such substances. Therefore none of the target substances (except heavy metals) can be traced from the environmental and emission monitoring programmes[63]. Another problem is the absence of the precautionary principle in the legislation e.g. a regulatory activity starts only if health problems are scientifically proven.

This different understanding and perception results in a lack of attention towards the current HELCOM priority hazardous substance list and, therefore, impede Russian reporting under HELCOM requirements.

Recommended Action	
1	The basic step for Russia, in order to be able to identify and report on the HELCOM "hazardous" substance is an agreement between the HELCOM contracting parties with its member Russia that the HELCOM definition of "hazardousness", which is based on the PBT concern (or equivalent level of concern) would also be introduced into the Russian strategies/policies on protection of the marine environment from land based sources. This would include introduction of an appropriate definition of "substances of high long term environmental concern", a "minimisation goal" related to these substances and the "precautionary principle" in the corresponding legislation.
Actors	Federal state authorities in RU, HELCOM Contracting Parties/Secretariat
Target group	Federal legislation on i) chemicals, ii) protection of water and iii) environmental permitting of production sites/installations
Time frame	Short term (2008-2010)

[63] Only mercury and cadmium are monitored in waste water discharges

Recommended Action	
2 To achieve this, there is a need in Russia to facilitate a better understanding of the EU system and vice versa in HELCOM of the Russian system, e.g. comparison and exchange among experts. An in-depth discussion process could be initiated through HELCOM with the different Russian state authorities (environment, health, economy etc) and subordinate scientific bodies to come to an understanding of the PBT concept and its applicability in Russia in the future.	
Actors	Federal and regional (NW) state authorities, HELCOM Contracting Parties/Secretariat, EU experts, scientific-research institutions in RU (Fed. and NW)
Target group	Stakeholders from different sectors (NW Russia)
Time frame	Short term (2008-2009)
Recommended Action	
3 This understanding should be also supported by screening measurements in order to demonstrate with concrete examples the occurrence of man made, environmentally hazardous organics in sewage systems and in the environment (in particular in biota). It is proposed to carry out such surveys for a limited number of substances, as for example the target substances of the present study [see action 13]	
Actors	Federal and regional state authorities and scientific-research institutions in NW RU
Target group	Federal and regional monitoring and data collection bodies
Time frame	short-term (2008-2009)

5.2 Legal basis

5.2.1 International level

Russia is a party to many international agreements. However, the Convention on POPs (Stockholm) as well as the International Convention on the Control of Harmful Anti-fouling Systems on Ships are still not ratified and enforced in the Russian Federation. Furthermore, there is no clear implementation plan yet for the Globally Harmonised System (GHS) for classification and labelling of Chemicals, although the new draft "Chemical Act" from 2005 used GHS classification - but so far this is not adopted, nor its exact status is traceable. It exists only a very general political statement that GHS implementation is foreseen, same as ratification of POPs Convention.

The implementation of international requirements in the traditional fields of environmental protection (like the hazardous waste movement – Basel Convention, or transboundary air pollution – Geneva Convention) is more developed. However, the information on emission sources of heavy metals and the corresponding action plan is not publicly available and could not be traced during the present project[64].

[64] to be checked with RozTechNadzor

Table 5-1: Status of international agreements implementation for target countries[65]

Conventions	Estonia	Latvia	Lithuania	Poland	Russia
Stockholm convention	P, (A)[66]	S, R, T	S, R, T	S, L, A	S,A[67]
Geneva Convention	S, R, T, L, A	S, R, T, (A)[68]	S, R, T	S, R, T, L	S,R,T,L,A
Basel Convention	S, R, T	S, R, T	S, R, T	S, R, T, L	S,R,T,L,A
Control of Harmful Anti-fouling Systems on Ships	NO	R	R	R	NO

Explanatory note: P = in process, S = signed, R = ratified , T = transposed, L = national legislation is developed; A = action plan is developed, NO = none above-mentioned actions

The Stockholm Convention defines criteria for substances that are of high concern due to their persistence in the environment, long range transport, bioaccumulation and toxicity. Implementing the Convention includes identification of sources of identified POPs (including POPs contain in substances not meeting the POP criteria themselves) and actions to reduce emission, losses and discharges and/or to ban marketing and use. Thus, implementing the POP Convention is the first step in systematically addressing all substances of similar concern, including the HELCOM hazardous substances.

The GHS defines criteria to classify substances and mixtures with chronic environmental hazards, including those potentially qualifying for being identified as PBT/vPvB or equivalent level of concern. In particular the environmental classes “chronic 1” and “chronic 4” give a first indication of a PBT/vPvB concern. The GHS guidance on Safety Data Sheets requires the supplier to inform his customers on the content of such substances in products he sells to him (see A 4.3.3.2 of the GHS guidance on SDS). Implementing (and enforcing) the relevant building blocks from the GHS in Russia would substantially increase awareness and information on the presence of HELCOM hazardous substances in products on the Russian market.

Recommended Action

4 Ratify the Stockholm Convention and implement it through national legislation. This includes setting up an inventory of dioxin emission sources and an action plan to reduce the emissions.

Actors	Duma (Federal Parliament) and Federal state authorities
Target group	Federal legislation implementing international conventions
Time frame	short-term (2008-2009) ratification and setting up an action program;

Recommended Action

5 Implement the GHS building blocks on i) environmental classification of substances and mixtures and ii) guidance on Safety Data Sheets through national legislation.

Actors	Federal state authorities and industry (pilot region: NW)
Target group	Federal legislation implementing international conventions
Time frame	short term implementation (2008-2010)

[65] for more details see Annex Rus-3
[66] An action plan for the POPs-protocol exists
[67] partial implementation, Action Plain is under preparation; to be checked with RozTechNadzor
[68] Plan under development

5.2.2 National level

Currently, there is no core legal act, addressing hazardous substances in water. Very scattered requirements regarding hazardous substances can be found in different federal laws, governmental regulations and ministerial acts. Also, there is no specific legal instrument to directly restrict the marketing and use of chemical substances present the market. Thus, suitable legal instruments for most of the HELCOM hazardous substances are currently missing.

The key place is taken by i) the federal law "On Environmental Protection" (2002) establishing a framework for environmental protection including also environmental permitting, ii) the Water Code (2006) regulating wastewater discharges (standard-setting, permitting and enforcement) and iii) several regulatory acts recently adopted by the Federal government. The Water Code provides the procedure of decision-making by executive authorities as an authorization to discharge. The federal law "On Air Protection" (1999) addresses issues of air quality and air emission limitations, provides a permitting procedure for facilities that emit pollutants and outlines the control procedures.

The federal law "On Technical Regulation" (2002) opens a new area of comprehensive regulation – quality of products (including buildings and constructions), processes of their production, operation, storage, trade and disposal. Therefore it concerns directly environmental limitations at various stages and waste disposal.

Of particular importance is the federal law "On Sanitary and Epidemiological Well-being of the Population" which regulates standard-setting, permitting and enforcement in relation to air, water and waste in human settlements. So far there has not been any known proposal to include PBT considerations into assessment of hazardousness of chemical substances.

In general, the Russian environmental legislation is stipulating that substances may not be used until environmental concentration limit values (PDK) have been assigned. Currently such limit values are assigned for approximately 1500 substances and preparations (1356 entries for sanitary purposes, 1204 entries for fishery water; some substances are only in a single list). Similar stipulations can be found in legal acts on the management of hazardous chemicals: Substances must not be used without having been notified to the state register (Registry of Potentially Hazardous Chemicals).

In table 5.2 illustrates the status of some target hazardous substances with regard to these different legal requirements. Based on these examples a number of observation can be made which are possible representative in a broader sense:

- Chlorinated paraffins are in legal use[69] (even a technical norm (TU) is issued), but there is no PDK for them.
- A substantial list of perfluorinated substances exists, produced upon request in a single company[70], but none of them having a registration nor a PDK assigned, but a corresponding technical norm has been issued.
- The number of available PDKs is surprisingly high compared to the number of substances for which environmental quality targets exist in EU member states. This may be interpreted as an indication that a transparent regulatory process based on which environmental quality targets are assigned does not exist in Russia.

69 Evidence by internet research, see Annex 8
70 Evidence by internet research , see Annex 8

Table 5-2: Legal occurrence of selected target substances according to chemical and environmental legislation

Substance	Registered	Sanitary PDK, mg/l	Fishery PDK, mg/l	Toxicity class	CAS No provided
Cadmium	YES	0,001	0,005 (0,01)	2	YES
Mercury	YES	0,0005	< 0,00001 (0,0001)	1	YES
PCB	NO	**NO**	< 0,00001	1	N/A
OP-7 (GOST 8433 – 819)	YES	0,1	0,3	4 / 3	NO
Chlorinated paraffins (TU-6-01-16-90**)**	YES	**NO**	**NO**	-	NO
Perfluorheptanoic acid	NO	1	**NO**	2	YES (375-85-9)
5-oxo-6-perfluorhep-tanoic acid Na salt	NO	**NO**	7,0	3	NO
Perfluor nonaoic acid	NO	**NO**	0,1	4	NO
Ethoxylated perfluor-decylalcohol	NO	0,1	**NO**	3	NO
Pentabromodiphenyl oxide **($C_{12}H_5Obr_5$)**	NO	**NO**	Discharge prohibited	Not toxic[71]	NO
Tributyl[(2-methyl-1-oxoprop-2-enyl) oxy]tin (= **tributyltin methacrylate**)	NO	0,0002	**NO**	1	YES (2155-70-6)
Tributyltin chloride	NO	0,02	< 0,00001	2	YES
Triphenyltin chloride	NO	**NO**	< 0,00001	1	NO

Another issue of concern is the common practice of assigning “provisional” environmental concentration limit values (OBUV, VDK). In legal terms it means that they should be assigned only in certain cases, valid for not more than for 2 years, and upon availability of an action plan to achieve the PDK. In practice, however, the OBUV has become widely used as administrative and industrial community is considering PDK values generally too strict, often claimed to be exceed by natural background concentrations, or not taking into account actual pollution control possibilities.

[71] restriction due to covering the bottom of the water body

Recommended Action	
6	Legislative demands with regard to hazardous substances being of concern due to their PBT properties should be included into Russian federal legislation. The new Water Code and the Law "On Environmental Protection" should be amended analogous to the EU WFD (priority substances) and the EU IPPC Directive (Indicative List of Main Polluting Substances; operationalised as described in chapter 4.4.2 of this report). Also, the concern related to persistent and bioaccumulative substances, provisions to classify such substances and to communicate related information in the market, as well as mechanisms to restrict the marketing and use should be incorporated into the Russian Chemical Act [Follow-up to action 1,4, and 5]
Actors	Federal state authorities and scientific-research institutions
Target group	Federal legislation on chemicals and environmental protection, enforcement.
Time frame	Medium-term (2008-2012); enforcement (long-term)

5.3 Institutional setup

A large number of different authorities are involved in management of hazardous substances: Ministry of Health (Registry of Potentially Hazardous Chemical and Biological Substances), Ministry of Natural Resources (especially Water Resources Agency - Rosvodresursy), Ministry of Energy and Economy, Governmental Agency "Rostechnadzor" (Federal Service of Environmental, Technological and Nuclear Supervision), Ministry of Health Care and Social Development by Governmental Agency "RosPotrebNadzor" (Federal Service on Protection of Consumer Rights; responsible for elaboration of hygienic norms for substances), Ministry of Agriculture (elaboration of environmental quality standards for potentially hazardous substances). However, there is **no "competent authority"** with leadership over others designated on chemicals management.

In Figures 2 and 3 responsibilities on hazardous substance management and environmental permitting are illustrated:

Figure 2: Institutional setup of hazardous substance management in Russian Federation

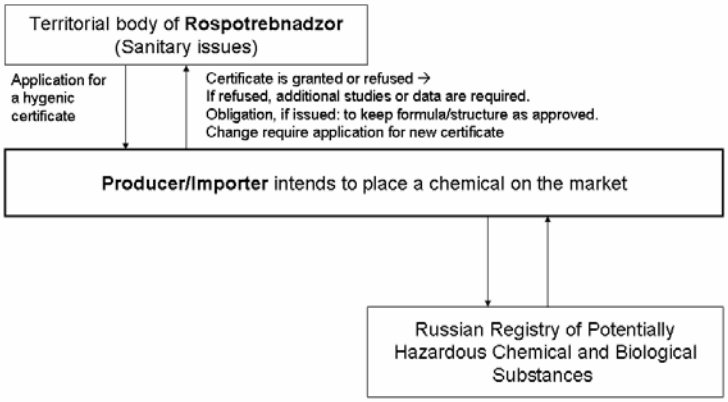
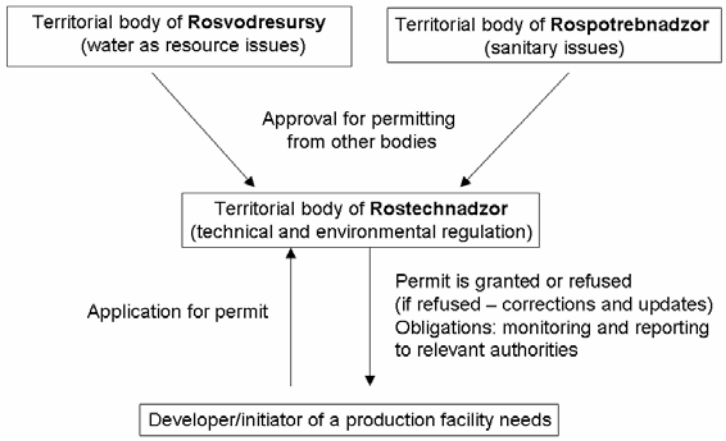


Figure 3: Environmental permitting in the Russian Federation



During the application of an environmental permit, information is forwarded to those authorities, which are responsible for setting the sanitary and fishery PDK. The Registry of Potentially Hazardous Substances seems to be a stand-alone system (see section on "Requirements to products and market control"), and it is not clear if any flow of information or cooperation exists between RosPotrebnadzor and the Registry while processing their applications from producers and importers.
The status of Registry of Potentially Hazardous Chemical and Biological Substances is anyway not fully transparent – its representatives are participating actively in international fora on chemicals management, but the organisation is quite "invisible" at national level.
Furthermore, it is not obvious if there is any coordination between RozPotrebNadzor and Ministry of Agriculture while setting plans for PDK development, and if any plans are existing at all (or how a PDK development is initiated).

In addition, there has been extensive reorganisation of administrative structure and responsibilities since 2002, which may be not finalised yet as different authorities are still competing to gain or re-gain certain responsibilities. This has lead to the situation, that the Ministry of Natural Resources and its sub-structures, which are responsible for the implementation of the HELCOM recommendation 19/5 and reporting to the HELCOM, are lacking instruments and information from the other governmental bodies – for instance: currently RozTechNadzor is responsible for environmental reporting, but it is neither a HELCOM partner nor obliged to provide the relevant information to the environmental authority.

Recommended Action	
7	Carry out a pilot project (e.g. "clean fish food from regional waters") in a selected pilot region North-West Russia (HELCOM target area), to facilitate the cooperation among the different national and regional authorities holding information on the hazardous substances of concern. This includes also rules of access of the civil society to these data. Based on the experience of such a pilot exercise, institutional setup and cooperation could be strengthened. This would also increase the availability and quality of information at the local, regional and national levels.
Actors	Federal and regional authorities, donor agencies, scientific/research institutions, NGOs
Target group	relevant authorities and stakeholders on NW RU
Time frame	medium-term (2008-2010)

Recommended Action	
8	Experience exchange with relevant EU experts and comprehensive training programmes for the most important authorities would be a long term action.
Actors	Federal and regional authorities, donor agencies, EU authorities and experts/consultancy
Target group	relevant environmental and health authorities
Time frame	long-term (2008-2015)

5.4 Environmental permitting

The Russian system for environmental permits of industrial installations and processes is currently under revision, amongst others, also with the help of a large scale Technical Assistance project funded by TACIS, but it is not predictable, when and if at all the system will change and which result the project will reach.

BAT activities in Russia	
Case	A pilot project in NW Russia aimed at introducing BAT into the legal requirements was carried out with support from foreign donors during which a number of pilot enterprises have received BAT-based permits with the purpose to demonstrate the applicability of BAT in Russia. However, due to several factors (including administrative reforms where some project partners – state bodies - were reformed or simply abolished) these pilot enterprises were forced to get a second ”regular” permit after some time in order to follow the existing national requirements Another project addressing the pulp and paper industry has developed BAT guidelines for this branch – however, it is still not adopted as an official guidance, i.e. it cannot be used for permitting.
Conclusion	BAT implementation in Russia is far from being reality: one of the main reasons is the lack of approved technologies, relevant guidance and standards. Pilot enterprises could loose their motivation to take part in future actions due to such experiences and current neglecting official attitude towards BAT principles.

The current Russian environmental permitting system does not support a strategy towards the prevention of emissions of hazardous substances:

- The legislation requires to use state “approved” techniques rather than “best available” techniques. Thus the legislation includes a mechanism to freeze the technological state of the art.
- The system prevents transparency on the substances used at company level. This is due to the fact that a substance, for which no PDK exists, is not allowed to be discharged, unless the applicant provides a PDK and carries out local monitoring. This can be a costly exercise companies try to avoid.
- There are no transparent rules and binding information requirements related to the content of an application and no rules on the methodology to derive a PDK for a substance to be discharged.
- The system allows the enterprises to pay for pollution instead of fulfilling legal obligations. This approach is not comparable with the “polluter pays” principle established in the EU, since the Russian system seems to be quite flexible to compensate incompliance with legal norms through fees and fines.

Recommended Action	
9	Industry permits should explicitly require ceasing emission and discharges of substances being of high environmental concern due to persistency and bioaccumulation. It is recommended to elaborate a Russian version of BAT guidelines (like for pulp and paper industries) for industry and permitting authorities. However, they should be treated as official standard and not be neglected after a while. The elaboration of permits, including activities concerning hazardous substances, should be harmonised and a template produced giving guidance and setting standards.
Actors	Federal authorities, donor agencies and scientific/research institutions
Target group	industry sector and environmental/health authorities
Time frame	medium-term (2008-2012)

5.5 Registration of Chemicals and market surveillance

Theoretically, Russia has a very strong pre-market control – but in practice, the system is not preventing the introduction of products on the market, which are not assessed: A substance may not be placed on the market before being registered in the Russian State Register of Potentially Dangerous Chemical and Biological Substances (established in 1992). In 2003 this register contained records of ca. 1,500 substances. Quite obviously it does not include all substances which are actually in use (for comparison, EINECS contained 100,204 entries) and this is the main weakness of the register.

The list of substances is regularly published every 3-5 years as a book and contains the following information: name of the substance, CAS number, the number in the register, number of state registration, registration year, date of validity of the registration, but the information on properties is available at the register only upon request (payable service); amounts on the market are not recorded in the register.

The system for plant protection products is more comparable with the EU system: the plant protection products have to be registered before entering the market; no plant protection product may be used, until registered (e.g. a white list similarly as in the EU exists). Endosulfane, being a target substance of the project, is NOT mentioned in the Russian list for acaricides and insecticides.

In Russia a state register for biocides exists for disinfection products to be used in households. [72]Before being introduced on the market, household chemicals have to undergo expertise and receive a hygienic certificate from RosPotrebNadzor. However, long term (chronic) environmental effects are not assessed. The data on hygienic certificates are highly confidential and are most likely not processed further.

The interlinking of the registers with the environmental permitting system is unclear – obviously there is neither exchange of information between registering of chemicals and environmental permitting nor awareness and knowledge of the experts of both systems on the information of the other one. Currently there are no uniform requirements towards the classification of chemicals for placing them on the market. It should be made clear, how far the plans for implementation have developed and whether it includes the component of environmental classification. Besides, the system of CAS numbers is not really used in the Russian Federation, hence challenging the identification of substances in Russia.
The control of chemicals in retail sale is foggy, e.g. it has not been clarified to which extent RosPotrebNadzor – the authority in charge of supervising shops – shall control chemicals.

[72] Available at http://fp.crc.ru/ (Last accessed, 14/09/2007). In total 583 entries (last update April 2007).

Recent developments in Russia show that REACH as a system for registration and authorisation of chemicals is attractive for Russia and has a lot of supporters. Efforts are currently made to develop new framework legislation in Russia, transferring chapters of the REACH regulation into Russian legislation, especially, since some elements of REACH (e.g. Register of Potentially Hazardous Substances) are already existing in Russia.
Also, Russia with its exports to EU markets is one of the first concerned countries facing the new registration obligations and has an interest to keep its market share for chemicals at EU market.

Recommended Action	
10	Capacity building for Russian stakeholders on the deeper understanding of REACH and its origin is of importance to avoid the common myths that REACH is "just the same way of registering chemicals which anyway exists in Russia since a long time". We recommend promoting the right understanding of REACH in Russia to avoid further misconceptions with "registration" and to start with capacity building for exporters. These stakeholders have the most rationale intrinsic interest of under-standing REACH. Such action would ensure that parts of industry, so far difficult to address and get hold off, would be involved voluntarily, as being highly interested in the EU markets. The most relevant element for the BSAP in this action is the PBT assessment for each substance > 10 t/a before it can be registered for the European market. Thus with support from a small number of motivated industries the process of data collection, assessment and decision making can be worked out. The experienced based model can be later on transferred to the internal Russian market.
Actors	Federal and regional authorities, EU experts and scientific/research institutions
Target group	industry sector, environmental/health authorities and NGOs in NW RU
Time frame	short-term (2008-2010)

Recommended Action	
11	Cessation of emission, losses and discharges of HELCOM hazardous substances can only be achieved if there is a mechanism to systematically assess the substances placed on the market in NW Russia with regard to their intrinsic persistency, liability to bioaccumumulate and toxicity (PBT assessment). Therefore it is recommended to support Russia in setting up a substance registration system similar to REACH in the long term. Based on a pilot project with exporting companies, setting up a development strategy for such system may start from 2010. In such strategy it should be considered whether regionalisation is possible since it is unlikely to run such a system as a central register without support from regional authorities.
Actors	Federal authorities, EU experts, industry
Target group	industry and authorities in NW Russia
Time frame	long-term (2010-2020)

5.6 Marketing and use restrictions

Some of the target substances of the present project are in unrestricted use in Russia (documentation see Annex 8), e.g. nonylphenol ethoxylates (mixtures of alkylphenol ethoxylates C8-C12; introduced as OP-7 in registries)

- liquid chlorinated paraffins
- perfluorinated compounds (PFAS, but no PFOS detected

The current Russian legislation does not include dedicated and generally applicable mechanisms to restrict the marketing and use of chemical substances present in the market. Thus it may be necessary to prepare the legal basis before action 13 can be carried out (see action 7).

Recommended Action	
12	Prepare for eventually banning Nonylphenols and Nonylphenolethoxylates, short chain chlorinated paraffins, pentaBDPE and OctaBDPE and PFOS for marketing and use in Russia. Start with an impact analysis for North-West Russia for a scenario that the EU marketing and use restriction would be taken over 1:1 to Russia.
Actors	Federal authorities, industry companies, local research organisation and EU experts
Target group	trade and industry in NW RU
Time frame	short-term (2008-2010)

5.7 Monitoring, data and information availability and quality

As already mentioned, HELCOM target substances (investigated under the current project) are only partially monitored (mainly heavy metals – Cd and Hg), partially regulated (those having a PDK assigned) and, in most cases, they are not really investigated, consequently, available data is very limited or even inexistent.

Information on HS is highly scattered among different authorities (Ministry of Natural Resources, Rostechnadzor, Rospotrebnadzor, and Hydrometeorological Agency) and in various databases. In addition, these data are not shared among different users and often are considered as a commercial product thus preventing information dissemination and systematic data collection.

Data quality is suffering from the issues mentioned above – this is clearly visible in the current HELCOM reporting activities when data is collected in an ad-hoc manner and not always sufficiently processed.

Vodokanal-case on PCB	
Case	A transport company paid a fine 250,000 Roubles when Vodokanal detected PCB in water discharged to municipal sewery in their spot-test programme. Monthly follow-up tests did not indicate PCB and in fact, company is nor using PCB neither do they have transformer units on their territory. On the neighbouring territory, however, a large boiler house with transformer stations is operating.
Conclusion	There is no sufficient processing of findings, e.g. source analysis; the case supports the suspicion that the environmental permitting system with associated PDK assignment and monitoring is a "money making tool" for enforcement authorities; b) it could be an analytical mistake; if so, the reliability of results of monitoring programmes is not very high.

The quality and availability of data is also decreasing due to limited state financing for the monitoring programmes and missing limit values for many HELCOM substances. These factors are of high concern for private businesses – in case of disclosing new substances at their own sites they would have to develop PDK values and then conduct local monitoring, which is very costly. Therefore, this "information vacuum" is a support to the status-quo, since both sides (state and enterprises) benefit financially from a less careful treatment of HS.

Recommended Action	
13	Screening of HS at Vodokanal\WWTF. This action seems to be highly feasible and recommended as a potential action of the BSAP in order to find relevant substances and focus future investigations. Such one-off action as recently undertaken in Lithuania, which is analysing municipal waste water effluents would be a recommended action, possibly best in one target region bordering the Baltic Sea, e.g. Kaliningrad region, Leningrad region or St. Petersburg City. The long year intensive cooperation between the St. Petersburg Vodokanal waste water treatment company and the Finnish Contracting Party of HELCOM could lead to a good project by transferring the Finnish methodology to Russia and giving it a test. This would then also give evidence of the occurrence or non-occurrence of the target substances in Russian waters and a reason for including them into state reduction and monitoring programmes. Referring to the previous experience with PCB examination, St. Petersburg Vodokanal is ready to take an active part in this action and co-fund it.
Actors	St. Petersburg Vodokanal (or other WWTF), federal authorities, donor agencies, consulting bodies/research agencies
Target group	St. Petersburg Vodokanal (or other WWTF)
Time frame	short-term (2008-2009)

5.8 Management of hazardous substances on company level

Table 5-3 provides an overview on the type of companies contacted and visited under the current project. The findings and conclusions are based on sample of companies.

Table 5-3: companies contacted for site-visits performed under the project

Industry branches	Number of interviewed/ approached companies	Positive feedback (ready for site-visits)	**Negative feedback (incl. given reasons)**	
			No interest and motivation	Absence of target substances
Transport	1	1		
cable coating	1	1		
Chemistry/lacquers and paints	1		1	
Chemistry/plastic	2	2		
Chemistry/cosmetics	1		1	
furniture	1			1
Machinery	2	1		1
metal processing	1		1	
Total number	**10**	**5**	**3**	**2**

The identification of substances of concern at company-level is difficult: supply of safety data sheets with dangerous products is not obligatory, the system of CAS numbers is not really used, and there are various different classification systems for hazardous chemicals in use. Companies are ready to follow requirements of their business partners abroad, and thus e.g. all exporters are keen to improve their own performance. Due to the growing number of ISO 14000 certified companies, advanced enterprises are also ready to pay more attention towards the HS issue. However, even companies motivated to get an overview on the (potentially hazardous) chemicals they use fail with their efforts due to the absence of appropriate instruments to classify and labelling chemicals and to communicate chemicals safety information in the supply chains.

Hazardous substance inventories of enterprises	
Case	A cable-coating company, having ISO 14000 certificate and existing environmental policies, as well as environmental and health specialists, is ready to cooperate on HS issues and screen used chemicals regarding target HELCOM substances. However, they import several products from the EU market and have rather limited information from their suppliers, which the cable coater would however need to comply with Russian legislation (e.g. sanitary certificate and SDS). In order to get information on the dangerous substances used in the preparations they must rely on the good will of their suppliers, since officially suppliers are not requested to supply all the information the Russian company needs. Naturally, not all EU suppliers would be eager to provide such data if it is not mandatory.
Conclusion	even in such rather rare cases that a company is really interested and ready to dig into HS investigations, they still depend on their suppliers' willingness to provide "extra data" i.e. own initiatives are not sufficient enough and therefore state policies and requirements should be changed in order to make such investigations a norm

Recommended Action	
14 Since the lack of awareness in the market and among authorities is enormous, information materials in an easily understandable language and systematic training, together with a train-the-trainer concept, are recommended to be implemented in a long term project, supported by the Russian government. It is obvious that a larger investment into local trainer capacity and also education (university) must be undertaken to transfer the basic knowledge and understanding to industry.	
Actors	Federal authorities, donor agencies, consulting bodies/research agencies and NGOs
Target group	industrial sector
Time frame	long-term (2008-2015)
Recommended Action	
15 Harmonising the Russian system with GHS (classification, labelling, SDS), as well as the systematic introduction of the CAS numbering-system in the registries of Russian Federation, would be a very important step towards a better management of chemicals in the industries.[see actions 5,6, and 11]	
Actors	Federal authorities, donor agencies, executing bodies, scientific and research institutions
Target group	existing HS regulations and norms in the Russian Federation
Time frame	long term (2008-2015)

ANNEX A.1
List of recommended actions

Recommended Actions related to the Baltic States and Poland

No.	Recommended action	Actors	Target groups	Time frame
1	The nature of substances covered under Recommendation 19/5 and the related concern should be more clearly defined and explained. The "hazardous substance" phrase should possibly replaced/complemented by a phrase more specifically addressing the concern..	HELCOM bodies; Environmental Ministries of HELCOM Contracting parties; research institutions	Industry, public, authorities	Short term (2008-2010)
2	Substances being of concern due to their high persistency and tendency to bio-accumulate (vPvB) should be addressed under HELCOM 19/5 regardless any available information on toxicity.	HELCOM bodies; Environmental Ministries of HELCOM Contracting parties; research institutions	EU fora responsible prioritising substances and launching regulatory action if needed	Short term (2008-2010)
3	Identify substances which are not covered by the EU PBT/vPvB criteria but which nevertheless present an equivalent level of concern for the marine environment (action for all HELCOM contracting parties).	HELCOM bodies; Environmental Ministries of HELCOM Contracting parties; research institutions	EU fora responsible prioritising substances and launching regulatory action if needed	Short term (2008-2010)
4	Initiate and support information campaigns addressing authorities, industry and societies in the new Member States (and Russia), to better explain the "hazardous substance" concern. Projects of common public interest like e.g. "clean fish food from regional waters" or "responsible use of fire" may be suitable issues for such public campaigns. [see also 17]	Ministries of Environment and NGOs of the target countries	Public and municipalities of the target countries	Short term (2008-2010)

Recommended Actions related to the Baltic States and Poland

No.	Recommended action	Actors	Target groups	Time frame
5	Reduce dioxin and heavy metal emissions from private and municipal heating through an investment program to support the technical improvement (energy efficiency, temperature and oxygen conditions, low dust techniques, regular inspection by technical personal) of domestic and municipal heating. Set up a binding and enforceable norm for the maximum chlorine content in solid fuels for domestic heating (e.g. 0.1%). In long terms, this may also lead to a substitution of hard coal by other fuels. Launch a public information and engagement campaign on "responsible use of fire". This would include the communication and explanation of simple rules like: i) No waste burning in stoves, open fires or bonfires, ii) use dry and preferably hard-wood for heating and open fires, iii) operate stoves at optimal conditions.	Environmental ministries and municipalities in Poland	Industry sectors producing heating devices, local service companies, municipalities, private households	long-term (2008-2018)
6	Reduce heavy metal emissions from the energy production sector and industrial burning processes through upgrading of dust cleaning installations and use low mercury hard coal or, in the long term, substitute hard coal by other energy sources.	Ministry of Environment, Ministry of Economy, Poland	Industry	long-term 2008-2018
7	Improve the management of landfills in order to prevent landfill fires. Prevent incineration of industrial waste without or with low efficiency gas cleaning systems. This would include improved supervision of waste stream by the authorities as well as bringing industrial waste incineration site in line with the requirements of the EU Directive on Waste Incineration.	Ministry of Environment and Inspectorates, Poland	Waste management sector	medium term 2008-2012
8	Reduce cadmium and dioxin emissions from steel production by installing BAT. This should include Dioxin emission monitoring and additional dust/dioxin abatement systems (fabric filtration). Reduce dioxin emissions from secondary aluminium and copper production as well as lime production facilities by installing BAT.	Ministry of Environment and permitting authorities, Poland	Industry	medium term (2008-2012)

Recommended Actions related to the Baltic States and Poland

No.	Recommended action	Actors	Target groups	Time frame
9	Particular action is proposed related to the use of MCCPs in isolation foams and sealants. It aims to substitute MCCPs and may include the following elements: Inform the respective formulators on the results of the EU Risk Assessment related to MCCP; launch a project on comparative cost-benefit-analysis related to available alternatives in co-operation with the concerned companies; carry out a market analysis in North-West Russia to explore the potential demand for more environmentally sound building and construction chemicals;	Ministry of Environment in Cooperation with Ministry of Economy of Estonia and Latvia	Manufactures of building and construction chemicals	Short term (2008-2010)
10	Carry out screening measurements in WWTP related to brominated flame retardants in Latvia, Estonia, and Poland.. In case of significantly increased levels, search for local emission sources (e.g. textile finishing companies, plastic converters, waste treatment). If sources identified, support companies to comply with EU legislation	Ministries of Environment of EE, LV, PL,	Sewage treatment sector and companies discharging waste water into the public system	Short term (2008-2009)
11	Lithuania, Latvia and Poland as countries running already a product register should decide which role it shall play under the REACH system. Based on this, the registers should be further developed to form a complementary tool to REACH.	Responsible Ministries and Agencies in Lit, LV, PL	Government	Short term (2008-2009)
12	Starting the pressure and source analysis related to the EU list of priority substances as soon as possible. In this work, other substances of high concern for the water environment identified by HELCOM could be included as national priority substances.	Ministry of Environment and regional water authorities, waste water companies, in co-operation with Environmental inspectorates in EE, LV, LT and PL	Public policy	short term (2008-2010)
13	Development of technical guidance for IPPC permits addressing the hazardous substances in details. Implementing a series of training courses for authorities and companies.	MoE and permitting authorities in EE, LV, LT, PL	Permitting authorities and industry	medium term (2008-2012)

Recommended Actions related to the Baltic States and Poland

No.	Recommended action	Actors	Target groups	Time frame
14	National legislation should be amended establishing clear requirements with regard to the substances of concern. In those sectors, where the BREF documents explicitly require substitution, a qualified substitution statement should be part of the permit application.	MoE and permitting authorities in EE, LV, LT, PL	Government	Short term (2008-2009)
15	Strengthen market surveillance capacity and strategies, in particular analytical product checks – including resource allocation and staff training. Exchange of experience with market surveillance bodies in other EU countries.	Government and market surveillance bodies in EE, LV, LT, PL	Trade and industry	medium term (2008-2012)
16	Set up a support and enforcement structure for REACH to be operational from 2009. This includes in particular capacities to help industry to implement the new requirements related to i) safety assessment of substances (including PBT assessment) ii) the safety data sheet system (exposure scenarios) and iii) notification of articles containing substances of very high concern.	Competent authority for REACH, national help desk, product inspectorates, environment and health inspectorates in EE, LV, LT, PL	Trade and Industry	medium term (2008-2012)
17	Initiate and support a communication program on why the 2020 objective is important, how consumers, services, trade and industry would benefit and what the consequences are if policy fails to meet the objective. Such action should be based on a project of common interest like for example “clean fish food from local waters” or “responsible use of fire”. [see also action 4]	Environmental ministries and municipal authorities	Concerned trade and industry organisations, local service companies, municipalities, private households	medium term (2008-2012)

Recommendations related to the Russian Federation

No.	Recommended action	Field	Actors	Target groups	Time frame
1	Facilitate an agreement between the HELCOM contracting parties with its member Russia that the HELCOM definition of "hazardousness" would be introduced into the Russian strategies/policies on protection of the marine environment from land based sources and subsequently into the relevant legislation.	Political agreement	Federal state authorities in RU, HELCOM Contracting Parties/Secretariat	Federal legislation on i) chemicals, ii) protection of water and iii) environmental permitting of production sites/installations	Short term (2008-2010)
2	Initiate an in-depth discussion process through HELCOM with the different Russian state authorities (environment, health, economy etc) and subordinate scientific bodies to come to an understanding of the PBT concept and its applicability in Russia in the future.	Raising awareness	Federal and regional (NW) state authorities, HELCOM Contracting Parties/Secretariat, EU experts, scientific-research institutions in RU (Fed. and NW)	Stakeholders from different sectors (NW Russia)	Short term (2008-2009)
3	Carry out screening measurements in order to demonstrate with concrete examples the occurrence of man made, environmentally hazardous organics in sewage systems and in the environment (in particular in biota). [see also action 13]	Raising awareness	Federal and regional state authorities and scientific-research institutions in NW RU	Federal and regional monitoring and data collection bodies	short-term (2008-2009)
4	Ratify the Stockholm Convention and implement it through national legislation. This includes setting up an inventory of dioxin emission sources and an action plan to reduce the emissions.	Legislation	Duma (Federal Parliament) and Federal state authorities	Federal legislation implementing international conventions	short-term (2008-2009)
5	Implement the GHS building blocks on i) environmental classification of substances and mixtures and ii) guidance on Safety Data Sheets through national legislation.	Legislation	Federal state authorities and industry (pilot region: NW)	Federal legislation implementing international conventions	short (2008-2010)

No.	Recommended action	Field	Actors	Target groups	Time frame
6	The concern related to persistent and bioaccumulative substances, provisions to classify such substances and to communicate related information in the market, as well as mechanisms to restrict the marketing and use should be incorporated into the Russian Chemical Act. Also, the new Water Code and the Law "On Environmental Protection" should be amended analogous to the EU WFD (priority substances) and the EU IPPC Directive (Indicative List of Main Polluting Substances) [Follow up of action 1,4,5]	Legislation	Federal state authorities and scientific-research institutions	Federal legislation on chemicals and environmental protection Enforcement	Medium-term (2008-2012) Long-term
7	Carry out a pilot project (e.g. "clean fish food from regional waters") in a selected pilot region North-West Russia (HELCOM target area), to facilitate the cooperation among the different national and regional authorities holding information on the hazardous substances of concern.	Institutional co-operation	Federal and regional authorities, donor agencies, scientific/research institutions, NGOs	relevant authorities and stakeholders on NW RU	medium-term (2008-2010)
8	Experience exchange on institutional co-operation in the field of chemicals control with relevant EU experts and comprehensive training programmes for the most important authorities	Capacity building	Federal and regional authorities, donor agencies, EU authorities and experts/consultancy	relevant environmental and health authorities	long-term (2008-2015)
9	Work out a Russian version of BAT guidelines (like for pulp and paper industries) for industry and permitting authorities. The elaboration of permits, fully covering activities concerning hazardous substances, should be harmonised, and a template should give guidance and set standards.	Technical guidance on environmental permitting	Federal authorities, donor agencies and research institutions	industry sector, environmental and health authorities	medium-term (2008-2012)
10	Promote the right understanding of REACH in Russia. Start with capacity building for chemical exporters to enable some of these companies to maintain their exports to EU under REACH conditions	Capacity building	Federal and regional authorities, EU experts and scientific/research institutions	industry sector, environmental and health authorities	short-term (2008-2010)

No.	Recommended action	Field	Actors	Target groups	Time frame
11	Support Russia in setting up a substance registration system similar to REACH in the long term. In such a strategy it should be considered whether regionalisation is possible since it is unlikely to run such a system as a central register without support from regional authorities.	Legislation	Federal authorities, EU experts, industry	industry and authorities in NW Russia	long-term (2010-2020)
12	Prepare for eventually banning Nonylphenols and Nonylphenolethoxylates, short chain chlorinated paraffins, pentaBDPE and OctaBDPE and PFOS for marketing and use in Russia. Start with an impact analysis for North-West Russia for a scenario that the EU marketing and use restriction would be taken over 1:1 to Russia.	Legislation	Federal authorities, industry companies, local research organisation and EU experts	trade and industry in NW RU	short-term (2008-2010)
13	Carry out a one off screening for selected hazardous substances (Hg, Cd, SCCP and MCCP, pentaBDPE, octaBDPE, DecaBDPE, HBCD, NP and NPEO) at Vodokanal waste water treatment plant and possibly other WWTP in the Kaliningrad or Leningrad region or Petersburg City.	Measurements	St. Petersburg Vodokanal (or other WWTF), federal authorities, donor agencies, consulting bodies/research agencies	St. Petersburg Vodokanal (or other WWTF)	short-term (2008-2009)
14	Develop information materials for industry in an easily understandable language and carry out systematic training, together with a train-the-trainer concept,	Information and Training	Federal authorities, donor agencies, consulting bodies/research agencies and NGOs	industrial sector	long-term (2008-2015)
15	Harmonising the Russian system with GHS (classification, labelling, SDS), as well as the systematic introduction of the CAS numbering-system in the registries of Russian Federation. [see action 5, 6, 11]	Legislation	Federal authorities, donor agencies, executing bodies, scientific and research institutions	existing HS regulations and norms in the Russian Federation	long term (2008-2015)

ANNEX A.2:

Guidance for working with companies and formulators

COMPANIES

Goal: to identify whether target substances are used in the company, if so, in which processes, which products, what is the function, producers of products, amounts?, data on emissions available?.

Benefits for company:

- Knowledge in advance about problematic substances (most of them are under the list of priority/priority hazardous substances under WFD), so, their emissions to be ceased or reduced in the future – can think about actions already now
- Some of these substances (e.g. organotins, NP, SCCP, pentaBDPE) have limits for emissions to surface water already now (check your water legislation) . Some of these substances are also restricted for marketing and use in the EU, thus also here it is matter of compliance.
- Measures for specific substances/ processes/ companies will be proposed as a result of the project
- Maybe they can also use you to clarify some other questions related to other requirements

Preparation for visit/ Contact by phone:

- **Whom to contact**: 1) person whom we know in the company; in case of no previous contacts or person not working anymore 2) env. manager, technical director
- **What to clarify/agree**:
  - short info on goal of our visit – to look for certain substances. Make clear that no data connected with their company name will appear in the Report and will not be communicated to state authorities; however, the information on sector will get public.
  - if they have relevant processes where target substances could be used (based on the table 1);
  - if there is a need allowance from managers of the companies for visit and screening of target substances; if allowance is needed how it could be done: a) meeting, b) contact person agree with him; c) need for call/letter from our side. Here the supporting letter from national authorities would probably help (but better ministry not regional env. departments which controls company);
  - if they have electronic register of chemicals used in the company or not and if preparations are recorded in register till the level or substance or not; availability of SDS;

- agree that you will send short info you are interested in and ask company to prepare in advance (e.g. make SDS available for the meeting, identify and agree on meetings with relevant specialists etc.)
- agreement on the meeting and what we want to do/ whom to meet: 1) meet with person (technologist) who knows the processes we are interested in and raw materials used, 2) screen the chemicals register, 3) screening of SDS of relevant products, 4) maybe meeting with supply unit

Visit to company:

- meeting with technologists:
  - identify potentially relevant processes and chemical products used in the processes (trade names, origin), ask if he knows whether target substances are in the products used in these processes;
  - clarify tendencies/changes during last 5 years (i.e. if same products were/are used, decreasing, increasing use, what was changed)
- screen the chemicals inventory (look for CAS No. see table 2) with relevant person; if target substances are found, document as described below;
- screen SDS of relevant products (look for CAS No. see table 2) with relevant person; if target substances are found, document as described below.

If the products with target substances identified, get following information:

- from supply unit/inventory/SDS: used amounts for year 2003 to 2006[1]; concentration of target substance in product; producer of substance/product with substance; use/function of substance/product;
- from technologist: if the product could go to the water environment, approximately which percentage of product goes to water, which stays in produced product; volume of wastewater per year from that process?
- from technologist, R&D, supply unit of raw materials: if there are any plans to change these products, tendencies in used amounts in past 5 years and in future, any plans to change processes
- if target substance stays in final products, which company sells: 1) production volumes, t/y, 2) concentration of target substance in the final product, 3) market (domestic, which other countries, what share of domestic market company covers), 4) for chemical industry products – use of products (in which sector, what type of products they are further used)

Additional info:

- maybe from general talks it will be possible to get general info on that sector (number of companies, processes, products used, tendencies etc.) in the country.

Output/documentation:

- Sector, company
- Info on processes/used products

[1] All years would be good, however if it is only 2005 or 2006 it is better than nothing

Relevant processes	Products used*	Origin (producer)	If target substance identified	Based on which info source	Comments
					e.g. your judgement on reliability of information (quality of SDS); tendencies

*only types of products which might be relevant, as indicated in table 1

- Info on processes/used products with target substances

Process	Product	Origin (producer)	Used amount, t/a	Target substance	Conc. of TS in product	Use/ function of substance	If TS can go to water env.**	Volume of waste water from	Comments
									e.g. your judgement on reliability of information (quality of SDS); tendencies and changes

** approximately which percentage of product goes to water, which stays in produced product

- Additional info to document:
  - if target substance stays in final products of the company they sell:
    - production volumes, t/y,
    - concentration of target substance in the final product
    - market (domestic, which other countries, what share of domestic market company covers),
    - for chemical industry products – use of products (in which sector, what type of products they are further used)
  - any other relevant info from general talks, e.g. info about the sector in the country (number of companies, processes, products used, tendencies etc.)

Potential further steps of work with company in case if relevant products are used in the company but target substances are not stated in their content, SDS. It will depend on the agreement with companies and timing available. That could be:

- ask company to write letter to supplier and check if target substances do not really occur in the product;
- ask company to phone supplier and check if target substances do not really occur in the product;
- ask for contacts of supplier and do it yourselves.

FORMULATORS

Goal:

- to evaluate whether the company is aware of the hazardous substance issue (in general or related to its products)
- to understand which tools and procedures are in place to identify hazardous substances in raw materials
- to identify whether target substances are (or could be) contained in the raw material used to manufacture preparations (like e.g. metal cutting fluids, cleaners, textile finishing chemicals, plastic compounds);
- to estimate the amount of target substances or the amount of substances with the same technical function potentially used by the company in their products (very rough estimates are sufficient (< 10 kg/a, < 1 t/a, < 10 t/a, < 100 t/a, > 100 t/a)
- to get information on the total market of that kind of preparation/chemical product in our target area (Estonia, Latvia, Lithuania, Poland, and Russia) and how the competitors behave regarding hazardous substances.

Benefits for company:

- Knowledge in advance about problematic substances (most of them are under the list of priority/priority hazardous substances under WFD), so, their emissions to be ceased or reduced in the future – can think about actions already now
- Some of these substances (e.g. organotins, NP, SCCP, pentaBDPE) have limits for emissions to surface water already now (check national water legislation) or are restricted in marketing and use for the EU but they are not currently controlled. Thus the formulators may also face a compliance issue here. NOTE: The interviewer need to be well prepared to explain the regulatory situation to the formulator. This concerns both: The formulators own situation (marketing and use) and the customers situation in future (water permits).

Preparation for visit/ Contact by phone:

- **Whom to contact**: 1) person in the company who is known; in case of no previous contacts or person not working anymore 2) env. Or HSE Manager or product safety manager (person responsible for the correctness of the SDS for the own products), product developers
- **What to clarify/agree**:
    - brief information on the goal of the visit – to look for certain substances. Make clear that no data connected with their company name will appear in the Report and will not be communicated to state authorities; however, the information on sector will get public.
    - if they have relevant products where target substances could be used (based on the table 1);
    - if there is a need for an allowance from the management of the companies for visit and screening of target substances; if allowance is needed, what are necessary arrangements: a) meeting, b) contact person agree with him; c) need for call/letter from our side. Here the supporting letter from national authorities would probably help (but better ministry not regional environmental departments which control the companies);

- if they have electronic register of chemicals used in the company or not and if raw materials (preparations or substances) are recorded in a register till the level of (classified dangerous) substances or not; availability of SDS;
- agree that you will send short information notice about what you are interested in and ask the company to prepare it in advance (e.g. make SDS available for the meeting, identify and agree on meetings with relevant specialists etc.)
- agreement on the meeting and what we want to do/ whom to meet: 1) meet with person (technologist) who knows the products we are interested in and raw materials used, 2) screen the chemicals register, 3) screening of SDS of relevant products, 4) maybe meeting with supply unit

Visit to the company:

- meeting with a product developer and/or product safety manager and/or sales manager:
  - explain again the hazardous substance issue and what is the goal of the project; highlight the potential benefits for the company (but only when you have the feeling, that you tell something new)
  - get some general information on the market of the company (to which sectors and countries they sell products; which products; other companies doing the same competitors; approximate overall mass-flow of chemicals
  - discuss the technical function of the respective target substance we are looking for (Note: This is a help for the company to look into the relevant raw materials; potentially it triggers information on alternatives already used.
  - identify potentially relevant raw materials (trade names, origin), ask if it is known whether target substances are in the products; clarify the function
  - clarify tendencies/changes during the last 5 years (i.e. if the same products were/are used, decreasing, increasing use, what was changed)
- screen the chemicals inventory (look for CAS No. see table 2) with a relevant person; if target substances are found, document as described below;
- screen SDS of relevant products (look for CAS No. see table 2) with a relevant person; if target substances are found, document as described below.

- If the products/raw materials contain target substances identified, get the following information:
  - from supply unit/inventory/SDS: rough estimate on used amounts for year 2003 to 2006 concentration of target substance in product; producer of substance/product with substance; use/function of substance/product;
  - from technologist, R&D, supply unit of raw materials: if there are any plans to change these products, tendencies in used amounts in past 5 years and in future, any plans to change processes
  - if target substance was, is or will be in final products, which the company sells: 1) production volumes, t/y, 2) concentration of target substance in the final product, 3) market (domestic, which other countries, what share of the domestic market the company is coverning), 4) for chemical industry products – use of products (in which sector, what type of products are further used)

Output/documentation:

- Sector, company
- Info on products and raw materials

Relevant products	Raw materials used*	Origin (producer)	If target substance identified	Based on which information source	Comments
					e.g. your judgement on reliability of information (quality of SDS); tendencies

*only types of products which are substances or preparations (including plastic granules) and which might be relevant, as indicated in table 1

- used products with target substances

Product	Raw material	Origin (producer)	Used amount, t/a	Target substance (TS)	Conc. of TS in product	Use/ function of substance/ product	If TS can go to water env. at customers level or at own site**	Comments
								e.g. your judgement on reliability of information (quality of SDS); tendencies and changes

** approximate percentage of product which goes to water/which stays in the product produced.

- Additional info to document:
    - if target substance stays in the final products sold by the company:
        - production volumes, t/y,
        - concentration of target substance in the final product
        - market (domestic, which other countries, what share of domestic market company covers),
        - for chemical industry products – use of products (in which sector, what type of products they are further used)
    - any other relevant information from general talks, e.g. about the sector in the country (number of companies, processes, products used, tendencies etc.)

Potential further steps of work with company: if relevant products are used in the company but target substances are not stated in their content, SDS. It will depend on the agreement with companies and timing available. That could be:

- ask company to write a letter to the supplier and check if the target substances do not really occur in the product;
- ask company to phone the supplier and check if the target substances do not really occur in the product;
- ask for contacts of supplier and do it yourselves.

Table 1: HS and their potential uses

Substances	Source/process	Type of products
Metal industry		
SCCP/MCCP	Cutting, drilling	High pressure additive in metal processing fluids (both water and oil based)
NPE/OPE	Cutting, drilling	High pressure additive in metal processing fluids
TBT	Shipbuilding and repairing – removing paint and painting. Leaching to marine environment from sea ship hulls.	Antifouling paint
TPhT	Shipbuilding and repairing – removing paint and painting. Leaching to marine environment from sea ship hulls	Antifouling paint
PFOS	Metal surface treatment Electroplating (Cr plating and anodising and acid pickling)	Surfactant Mist suppressant
Electronic industry		
PentaBDPE	Electrical equipment (electronic circuits, TVs, monitors etc.)	Flame retardant
HBCDD	Electrical equipment (electronic circuits, TVs, monitors etc.)	Flame retardant
NPE		Soldering agent
OP	Production of electrical equipment Production of electric windings (e.g. in motors, transformers)	Electrical insulation varnish and bonding the windings Flux agent
PFOS	Semiconductors production: use in photo –acid generators, antireflective coatings, etch mixtures, photoresists, printing circuit board	Surfactant, process chemical, not part of the final product
Textile		
Polybrominated diphenyl ethers (pentaBDPE, octaBDPE, decaBDPE)	Finishing (textile coating)	Flame retardants
OP/OPE	Finishing (in most modern printing processes)	Used in printing ink formulations as emulsifier (mainly in styrene-butadiene co-polymers)
Hexabromocyclododecane (HBCDD)	Finishing	Flame retardant, back coating from polystyrene

Substances	Source/process	Type of products
NPE	Finishing	Surfactants, conditioning agent
SCCP	Finishing of technical textile	Flame retardant, agent for water resistance, antifungal agent
TBT	Finishing	Antifungal agent
PFOS	Finishing	Impregnation agent (water and oil repellent)
Plastic industry		
Polybrominated diphenyl ethers (PBDEs) and polybrominated biphenyls (PBBs	Formulation (blending lof polymers with various additives) and industrial use (production of finished plastic articles). Used in polyurethane foams, in thermoplastics such as ABS, polystyrene and polycarbonate: (**OctaBDPE** used in plastics in electrical installations: acrylonitrile-butadiene-styrene (ABS) polymers, also high impact polystyrene, polyamide and polybutylene terphtalate polymers, insulating wires, cables. **PentaBDPE** manufacture and different applications of flexible polyurethane foams. **DecaBDPE** used in plastic/polymer applications, insulated wires and cables, different electrical equipment.)	Flame retardants
Tetrabromobisphenol A (TBBPA) and its derivatives	Production of thermoset plastics such as epoxies, polyurethanes and polyesters	Flame retardant
NP	Production of plastic products	Adhesive, binding agent, process regulator, stabilizer, hardener for epoxy resins and plastic products for construction purpose (floor covering materials, paints, sealing compounds); soldering agent in insulated wires and cables
OP, butylphenols		Adhesive
Organotin compounds (TBT, MBT, DBT)	PVC, polyurethane, polyester production and processing	TBT is an impurity in stabilising agents containing MBT and DBT
HBCDD	Other than PVC plastics production; most used in the production of polystyrene (further used for construction insulating panels, textile backcoating, high impact polystyrene in electric housing, e.g. videocassette recorders)	Flame retardant

Substances	Source/process	Type of products
Octyltins	Production of rigid PVC potable water pipes and fittings	
Butyltins	Production of rigid PVC profiles and sidings, Venetian blinds, rain gutters, window profiles	
Phtalates (DBP, DEHP)		Softener for different polymer materials (especially PVC)
SCCP/MCCP	Production of PVC plastics	Plasticizers and flame retardants
Rubber industry		
Octylphenols, butylphenols		Adhesive
OP	Production of rubber for tyres	Tackifier
SCCP/MCCP		Plasticizer, flame retardant, adhesive
Tanneries		
SCCP/MCCP	Leather processing	Fattening and liquoring agent, impregnation agent
NPE	Degreasing	Degreasing agents
OPE	Leather finishing	Emulsifier in finishing agents
PFOS		Impregnation agent (water and oil repellent)
Chemical industry		
NPE/OPE	Industrial and institutional cleaning agents, polishing preparations	Surfactant, cleaning agent
PFOS	Manufacture of detergents, soap, cleaning/polishing preparations (floor waxes)	Surfactant
NP	Production of cosmetics	Moisturing, emulsifying agent
NP/NPE/OPE	Paints, varnishes and coatings production	Stabilizer, emulsifying agent, dispersant
SCCP/MCCP	Paints, varnishes and coatings production	Binder, plasticizer, flame retardant
Phtalates (DBP, DEHP)	Production of paints, adhesives, sealants, cosmetics	Plasticizers, softeners
NP/OP	Production of NPE/OPE, manufacture of resins, plastics and stabilisers, manufacture of phenolic oximes	
Chloroform	Pharmaceuticals	
Hexabromocyclododecane (HBCDD)	Production of expanded polystyrene	Flame retardant
PFOS	Fire fighting foams	
Pulp and paper industry		
Phenols (methylphenol, nonylphenol, butylphenol, octylphenol)		Aid agent, paper coating
PFOS		Impregnation agent (water and grease repellent)
SCCP		Solvent
Agriculture		

Substances	Source/process	Type of products
NPE	Pesticides	Co-formulant, solvent
OPE	Pesticides	Emulsifier, dispersing agent
TPhT	Fungicide for potatoes	
Endosulfan		Active substance
Food industry		
NP/NPE/OP/OPE	Cleaning of equipment	High performance surfac-tant
Public institutions (hos-pitals, schools, admini-stration, hotels…)		
NP/NPE/OP/OPE	Professional cleaning	High performance surfac-tant
Aviation		
TBT		Marking agent
NPE	De-icing activities in airport	De-icing agent
PFOS		Flame retardant, corrosion inhibitor, surfactant
Furniture industry		
PentaBDPE	Production of soft furniture	Flame retardant

Table 2: CAS numbers to look for

Substance	CAS number
2a. Tributyltin compounds (TBT)	
- Tributyltin compounds	688-73-3
- Tributyltin cation	36643-38-4
- Tributyltin oxide	56-35-9
- Tributyltin methacrylate	2155-70-6
- Tributyltin naphthenate	85409-17-2
- Tributyltin benzoate	4342-36-3
- Tributyltin chloride	1461-22-9
- Tributyltin fluoride	1983-10-4
- Tributyltin linoleate	24124-25-2
2b. Triphenyltin compounds (TPhT)	
- Triphenyltin	668-34-8, 892-20-6
- Triphenyltin acetate	900-95-8
- Triphenyltin chloride	639-58-7
- Triphenyltin fluoride	379-52-2
- Triphenyltin hydroxide	76-87-9
3a. Pentabromodiphenyl ether (pentaBDPE)	32534-81-9
3b. Octabromodiphenyl ether (octaBDPE)	32536-52-0
3c. Decabromodiphenyl ether (decaBDPE)	1163-19-5
4a. Perfluorooctane sulfonate anion (PFOS) and related com-pounds (at least 96 compounds), which potentially degrade to PFOS but only parent sulphonic acid and some of its commercially impor-tant salts are listed below (see more e.g. OSPAR 2005a, OECD 2002):	1763-23-1
- Perfluorooctane sulphonic acid	2795-39-3 70225-14-8
- Potassium salt for perfluorooctane sulphonic acid	29081-56-9
- Diethanolamine salt for perfluorooctane sulphonic acid	29457-72-5

Substance	CAS number
- Ammonium salt for perfluorooctane sulphonic acid - Lithium salt for perfluorooctane sulphonic acid	
4b. Perfluorooctanoic acid (PFOA) and PFOA-related substances such as its salts and derivatives but a few are listed below (see more e.g. OECD 2005): - Ammonium salt for PFOA - Sodium salt for PFOA - Potassium salt for PFOA - Silver salt for PFOA - Fluoride salt for PFOA - Methyl ester for PFOA - Ethyl ester for PFOA	335-67-1 3825-26-1 335-95-5 2395-00-8 335-93-3 335-66-0 376-27-2 3108-24-5
5. Hexabromocyclododecane (HBCDD) - 1,2,5,6,9,10-Hexabromocyclododecane - α-Hexabromocyclododecane - β-Hexabromocyclododecane - γ-Hexabromocyclododecane	25637-99-4 3194-55-6 134237-50-6 134237-51-7 134237-52-8
6a. Nonylphenols (NP) - Nonylphenol mixture - 4-nonylphenol - 4-nonylphenol, branched	 25154-52-3 104-40-5 84852-15-3
6b. Nonylphenol ethoxylates (NPE) - Nonylphenol ethoxylates - Nonylphenol monoethoxylate - Nonylphenol diethoxylate	 9016-45-9, 26027-38-3, 37205-87-1, 68412-54-4 20427-84-3, 27176-93-8
7a. Octylphenols (OP) - Octylphenols - Para-tert-octylphenol - Octylphenol	 1806-26-4 140-66-9 67554-50-1, 27193-28-8
7b. Octylphenol ethoxylates (OPE)	9002-93-1, 9036-19-5
8a. Short-chain chlorinated paraffins (SCCP or chloroalkanes, C_{10-13})	85535-84-8 (C_{10-13}), 85681-73-8 (C_{10-14}), 85536-22-7 (C_{12-14})
8b. Medium-chain chlorinated paraffins (MCCP or chloroalkanes, C_{14-17})	85535-85-9
9. Endosulfan	α-isomer: 959-98-8 β-isomer: 33213-65-9

ANNEX A.3
IPPC Permit overview

Industry sector	ESTONIA			LATVIA			LITHUANIA			POLAND		
	Installations requiring permit (Total no.)	Current permits (Total no.)	Permits screened	Installations requiring permit (Total no.)	Current permits (Total no.)	Permits screened	Installations requiring permit (Total no.)	Current permits (Total no.)	Permits screened	Installations requiring permit (Total no.)	Current permits (Total no.)	Permits screened
Textile finishing	**1**	**1**	**1**	**0**	**0 / 9***	**0 / 1***	**2**	**2**	**2**	**7**	**2**	**2**
Metal finishing	**4**	**4**	**4**	**3**	**3 / 97***	**3 / 17***	**0**	**0**	**0**	**57**	**57**	**4**
Electroplating	2	2	2	-	-	-	0	0	0	-	-	2
Shipyards	2*	2	2	-	-	-	0	0	0	-	-	-
Pulp & Paper	**2**	**2**	**1****	**0**	**0**	**0**	**3**	**3**	**3**	**30**	**26**	**2**
Leather	**0**	**0**	**1*****	**0**	**0 / 4***	**0 / 4***	**0**	**0**	**0**	**1**	**0**	**0**
Steel	**1**	**1**	**1**	-	-	-	**1**	**0**	**1**	**12**	**4**	
Smelters	**0**	**0**	**0**	-	-	-	**0**	**0**	**0**	**28**	**17**	**3**
Rubber and Plastics	**2**	**2**	**2**	**0**	**0**	**0**	**1**	**1**	**1**	-	-	-
Production of masterbatches	0	0	0	0	0	0	0	0	0	*	*	*
Manufacturing of products	2	2	2	0	0	0	0	0	0	-	-	-
Cable coating	0	0	0	0	0	0	1	1	1	-	-	-
Chemical industry	**8**	**3**	**3**	**5**	**5 / 36***	**5 / 2***	**4**	**4**	**0**	**110**	**100**	**14**
organic	5	1	1	4	4	4	0	0	0	75	72	10
inorganic	1	0	0	0	0	0	2	0	0	23	18	
fertilizers on base of phosphate, nitrogen and potassium	1	0	0	0	0	0	0	0	0	8	8	2
pesticides and biocides	0	0	0	0	0	0	1	0	0	4	2	2
resins&paints	1	2****	2	1	1	1 / 2*	0	0	0	*	*	*

* 2 IPPC due to solvents in paints

* 1st number indicates IPPC permits, 2nd non-IPPC permits

* included in organic chemical industry sector

** 1 permit not available in public permits information system

*** Company participated in pilot projects in 2000-2002, but as capacity is less than IPPC treshold, they decided not to apply officially for IPPC permit

**** a paint manufacturer voluntarily applied for IPPC permit

** Metal fiiniishing includes steel and smelters also

Estonia: IPPC permit details

No.	Installation or company	Branch & Target process	Permit issued in (year)	Hazardous substances used, incl these in preparations (also mention if the topic is partially covered, e.g. preparations listed but no hazardous constituents indicated)	List of haz. substances includes HELCOM ones, which?	BAT measures related to use of hazardous chemicals	1. Does emission of HELCOM hazardous substances including dioxins, Cd, Hg occur (to air, water, wastes) 2. Is emission in accordance with EU limit values?	If limit values exeeded, any BAT measures foreseen
1	Kreenholmi Valduse Ltd. (Ida-Virumaa County)	Textile finishing	2006	Yes, but most of the dyes and related chemicals are listed in table of not classified raw materials (it could be so as Kreenholm has certificate ECOTEX-100 on using "environmentally friendly" dyes, but hard to believe that everything is not classified). Total amount of information: 6 pages of A4 in table format	There are no CAS numbers mentioned, but following substances in certain products indicate possible concern: "porgulfatopersulfat" = PFOS (process:weaving; product: Quellax Flex 13,8 t/a, % of substance not mentioned); alkylphenylpolyglycolether (process: weaving: product PRECOSOLVE TOX 0,2 t/a)	Comprehensive list from textile finishing BREF issues with confirmation of BAT usage (3 pages). In wastewater discharge part there is general condition to avoid spills and discharges of hazardous chemicals. Annual reporting on used chemicals foreseen.	1. No (i.e. according to the permit)	-
2	Norma Ltd. (Harju County)	Metal engineering: electroplating (also manufacturing of plastic parts; minor solvent usage in degreasing)	2003	Yes, but in some cases content of preparations is not revealed. Total amount of information: 6 pages of A4 table format	(Heavy metal salts: Cr, Ni, Zn).	Comprehensive list of draft electroplating BREF issues (in total 9 pages). Measures like keeping inventory on hazardous chemicals, reporting on use, etc. foreseen	1. (Yes - Cr, Ni, Zn - discharge to municipal sewery, air emissions, haz. waste; tetrachloroethene - air emissions, haz. waste); 2. Yes	-
3	Vasar Ltd. (Harju County)	Metal engineering: electroplating (also minor solvent usage in degreasing)	2004	Yes. Total amount of information: 7 pages of A4 table format	Potassium perfluorosulphonate (CAS No 2795-39-3), < 15 % in product Candowet 500 (needed for avoiding chromium mist, amount of product up to 40 kg/a at full capacity, 0,0004 kg/m^2). (Also Cr, Ni, Zn, Cu, Sn, Pb; cyanides, trichloroethylene)	Comprehensive list of draft electroplating BREF issues (in total 9 pages). Measures like keeping inventory on hazardous chemicals, reporting on use, etc. foreseen. No specific measures for PFOS (also not considered in annual revisions)	1. Yes; 2. Yes. PFOS are discharged only due to carryover (reflected by amount of product to be added to the vat)	Measures were foreseen to improve wastewater treatment processes, etc. By now implemented
4	BLTR Ltd /Baltic Ship Repairing Company/ (Harju County)	Metal engineering: solvent usage in paints in shipyard (actually other > 10 daugther companies having activites on the same territory: foundry of pig iron, aluminium; production of pressurised gases; various metal engineering activities; hazardous waste management, etc are also covered by the permit.). Total number of pages in permit: 205	2005	Yes, but CAS No mostly not given; lot of unspecified base oils with unspecified additives	Possible concern: monoalkylphenol polyethylene glycolether in cleaner used for washing ship surfaces, content 5-8 %; amount used - not specified	Comprehensive list of draft surface treatment with solvents BREF. Specificly is mentioned that organotin antifouling paints are not used. As used paints contain other antifouling agents, it was foreseen that measures should be taken to avoid seawater contamination from painting processes. At the same time it is mentioned that while removing old paints it is not guaranteed that removed paint etc. is not contaminating sea water, but no further specific measures were considered in the permit.	1. (Yes - Zn, phenolics); 2. Yes	-

						BAT measures related to use of hazardous chemicals		
5	Loksa Ship Repairing Company (Harju County)	Metal engineering: solvent usage in paints in shipyard	2005	Yes	No	Comprehensive list of draft surface treatment with solvents BREF. Specificly is mentioned that organotin antifouling paints are not used. As used paints contain other antifouling agents, it was foreseen that measures should be taken to avoid seawater contamination from painting processes.	1. No	-
6	Estonian Cell Ltd. (Lääne-Viru County)	Pulp production (chemical-mechanical pulping)	2002	Yes, but some hazardous chemicals are mentioned in table of not classified raw materials	No	None	1. No	-
7	Nakro Ltd. (Ida-Viru County)	Tannery	draft pilot permit from 2001	Yes, but not always with CAS No	Possible concern: monoalkylphenol ethoxylate in leather finishing chemical Roda Mod, used ca 2 t/a	General measures proposed	1. (Yes - Cr); 2. Yes	comprehensive measures foreseen to improve waste water treatment
8	Galvex Estonia Ltd. (Harju County)	Steel: continuous zinc galvanising of steel sheet	2006	Yes, but not always with CAS No	No	Comprehensive list of BAT issues from Ferrous metal BREF. Inventory of raw materials required.	1. (Yes _ Zn, phenols). 2. Yes	-
9	Estiko Plastar Ltd (Tartu County)	Manufacturing of plastic foil and products; IPPC due to solvent usage in printing	2007	Yes	No	No specific measures, inventory of chemicals required	1. No wastewater discharge from production processes	-
10	Norfolier Baltic Ltd. (Harju County)	Manufacturing of plastic foil; IPPC due to solvent usage in printing	2005	Yes, but not all constituents revealed (mentioned tenside in cleaner without name and CAS No)	No	No specific measures, inventory of chemicals required	1. No wastewater discharge from production processes	-
11	Viru Liimid Ltd. (Ida-Viru County)	Chemical industry: manufacturing of adhesives	2005	Yes	No	No specific measures, reporting on used raw materials requried	1. No	-
12	ES Sadolin Ltd. (Rapla County)	Chemical industry: manufacturing of alkyd resins and paints	2003	Only list of trade names in the table of non-hazardous materials	No possibility to evaluate	Permit available in public system do not contain any specific measures nor detailed BAT comparison	1. No possibility to evaluate	-
13	Distrei Group OÜ (Harju County)	Chemical Industry: manufacturing of paints	2007 (in process)	Yes	Yes: in pigment paste used up to 9,0 t/a there are following constituents: 1) alkylphenol ethoxylate, CAS No 68412-54-4, content < 10 %; 2) Polyethoxyethylene nonylphenol phosphate ester, CAS No 68954-84-7, < 5 %	Draft permit proposal do not foresee any problem with wastewater from washing equipment to be discharged to common sewery (in permit application is estimated the concentrations and possible loads of hazardous substances, which are very low; proposal is to gather them separately and discharge in proper treatment plant)	1. Discharge of pigment pastes 2,5 grams per year (i.e substances of concern ca 0,4 grams)	-

Latvia: IPPC permit details

No.	Installation or company	Branch	Target proceses	Permit issued in (year)	Hazardous substances used, incl these in preparations (also mention if the topic is partially covered, e.g. preparations listed but no hazardius constituents indicated)	List of haz. substances includes HELCOM ones, which?	BAT measures related to use of hazardous chemicals	1. Does emission of HELCOM hazardous substances including dioxins, Cd, Hg occur (to air, water, wastes) 2.Is emission in accordance with EU limit values	If not, any BAT measures foreseen
1	Rebir	Metal finishing	Production of electrical instruments for building and construction. Processes: - cutting and flection of steel - mechanical treatment - welding, gridding - steel hardening - aluminium and plastics teeming - treatment of surfaces - assembling of production and packaging	2002	no	no	No inventory, requirement to phase out one product mentioned	no	
2	Liepajas Metalurgs	Metal finishing&Smelters and Steel	Metal producing and treatment: 1) installations for cast iron and steel first or repeated melting, including continues teeming, with power more than 2.5 tons per hour 2) installations for black metal processing- hot rolling-mill, where more that 20 tonnes of unrefined steel is being processed 3) black metal foundry with power more than 20 tonnes per day 4) Installations with electrolysis or chemical processes for metal surface treatment and bath for treatment is more than 30 m3	2004	yes (partly - for some preparations hazardous constituents are indicated, for some not)	no	Inventory	no	
3	Krāsainie lējumi	Metal finishing	1) installations for non-ferrous metal melting, including alloyage, where power is more than 4 tonnes of melted Pb and Cd per day and more than 20 tonnes of any other melted metal per day 2) hot rolling-mill, where more that 20 tonnes of unrefined steel is being processed 3) installations for covering metal alloy surfaces, which treat les than 2 tons per day 4) other facilities for iron, steel or other metal industrial treatment with area 1000 m2	2006	yes (partly - preparations listed but no hazardous constituents indicated)	no	Inventory	no	
4	Olain farm	Chemicals (pharmaceuticles)	production of pharmaceuticles	2005	yes	no	Inventory	Yes, Cd and Hg to water, emission limit values shown in permit	

							BAT measures related to use of hazardous chemicals		
5	Grindeks	Chemicals (pharma-ceuticles)	production of pharmaceuticles	2002	yes	no	Measures for substitution - concrete measures - e.g. To subbstitute substacne x by year 2005 wwith less hazardous substance	no	
6	Medprolnc	Chemicals (pharma-ceuticles)	production of pharmaceuticles	2006	yes	no	Inventory, Environmental action plan, need to reduce use of substacnes with R phrases 45,46,49,60,61	no	
7	Reaģents A	Chemicals (pharma-ceuticles)	production of pharmaceuticles, production of basic chemicals	2005	yes	no	Inventory, general statement "used chemcials can not be substituted, but regeneration possibilities need to be consis-dered, in order to reduce volumes of used chemicals"	no	
8	Biolars	Chemicals	production of chemicals, such sa srwa materials for paint and varnish production, plasticisers, resins etc.	2007	yes	no	Inverntory, substitution measures (e.g. a 2nd category reprotoxic substacne is substituted with less hazardius substance, butanol is being regenerated), permit in-cludes also Environmental action plan which foresees energy saving measures, regeneration possibilities for used substances and reduction of GOS	no	
Smaller installation permits (called B category permits)									
1	Lauma Fabrics	Textile finishing	dyeing, bleaching	29.12.2006.	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
2	Dabiskā āda	Leather	leather tanning less than 12 tonnes ready product per year Treated approx 14,5 tonnes of leather per year	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	9016-45-9 (Nonylphenol, ethoxylated, Rinverpal DM) 7,0 t per year	Inventory, substitution measures not foreseen		
3	RITAL	Leather	leather tanning less than 12 tonnes ready product per year	2004	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
4	Nākotnes ādminis	Leather	leather tanning less than 12 tonnes ready product per year	2004	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
5	RikGer	Leather	leather tanning less than 12 tonnes ready product per year	2004	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		

							BAT measures related to use of hazardous chemicals		
6	Raunas Lauktehnika	Metal finishing	Installations for iron, steel and other metals industrial treatment with production are 1000 m2 and more Company has various facilities, metal treatment process include cutting, welding, colouring	2007	Yes	No	Inventory		
7	IMR	Metal finishing	Installations for iron, steel and other metals industrial treatment with production are 1000 m2 and more Company produces machines for wood material treatment	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
8	SIA Dauer D	Metal finishing	Installations for iron, steel and other metals industrial treatment with production are 1000 m2 and more Production of electronic tools, which includes various metal treatment processes: - extrusion - milling - turning - drilling - sharpening - thermic treatment - polishing - covering with polymer materials. Producing one type of instruments (hand hammer), 950 pieces a month	2007	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
9	EASTMETAL	Metal finishing	Installations for iron, steel and other metals industrial treatment with production are 1000 m2 and more Treatment of black metal, assem-bling of details Area 4600 m2 (production), total area – 11 000 m2 1800 t/year treated Processes: Metal cutting, drilling, turning, assembling	2007	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		

							BAT measures related to use of hazardous chemicals		
10	Sperre Baltic	Metal finishing	Installations for black metal processing- with power till 20 tonnes per day Other installations for iron, steel and other metals industrial treatment with production area 1000m2 and more Caust iron smelting - year 5000 t Industrial treatment of black and colour metal	2007	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
11	AKG Thermotechnik Lettland	Metal finishing	Other installations for iron, steel and other metal industrial treatment with production area more than 1000 m2 . Production of aluminium radiators (100 pieces in year)	2007	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
12	J.J.Stainless SIA	Metal finishing	Other installations for iron, steel and other metal industrial treatment with production area more than 1000 m2 . Production power – 600 t/year various articles from steel	2007	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
13	Rešetilovs and Ko	Metal finishing	Other installations for iron, steel and other metal industrial treatment with production area more than 1000 m2 . Production of container type waste water treatment plants- 100 articles per year Processed metal – 600 tonnes annually	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
14	Rikta Met	Metal finishing	Other installations for iron, steel and other metal industrial treatment with production area more than 1000 m2 . Production of metal constructions 5000 tons per year	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
15	SIA Rauta	Metal finishing	Other installations for iron, steel and other metal industrial treatment with production area more than 1000 m2 . Production of metal constructions - 1000t/a	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
16	Lesjofors Springs LV	Metal finishing	Other installations for iron, steel and other metal industrial treatment with production area more than 1000 m2 . Production and treatment of metal articles, industrial area – 3800 m2	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		

							BAT measures related to use of hazardous chemicals		
17	CSK Steel	Metal finishing	Other installations for iron, steel ad other metal industrial treatment with production area more than 1000 m2 Production of metal constructions – 6000 t per year	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
18	ALMIKO	Metal finishing	Other installations for iron, steel ad other metal industrial treatment with production area more than 1000 m2	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
19	VEF radio-tehnika RRR	Metal finishing	- other installations for iron, steel and other metal industrial treatment with production area more than 1000 m2 - production of acoustic systems , production of metal products, metal selling	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
20	SIA Paritets	Metal finishing	- other installations for iron, steel and other metal industrial treatment with production area more than 1000 m2	2006	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		

							BAT measures related to use of hazardous chemicals		
21	Rīgas Kuģu Būvētava	Shipyards	1) Installations for black metal processing- hot rolling-mill, where more that 20 tonnes of unrefined steel is being processed 2) installations for non-ferrous metal melting, including alloyage, where power is more than 4 tonnes of melted Pb and Cd per day and more than 20 tonnes of any other melted metal per day 3) Installations with electrolysis or chemical processes for metal surface treatment and bath for treatment is more than 30 m3 4) Facilities for surface treatment, where in job process dust is produced, if total emission from installation is 10000 and more m3 per hour 5) Shipbuilding, swimming docks and dry docks 6) installations for iron, steel and other metals industrial treatment with production are 1000 m2 and more 7) storage of hazardous waste In total 110 ships are repaired and 11 new ones are build per year		Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
22	Tenax	Chemicals industry	Manufacture of: Paints, varnishes, mastics, insulation materials, sealants, cleaners	2004	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	85535-85-9 Alkanes, C14-17, chloro 180 tonnes per year 26027-38-3 ETHOXYLATED P-NONYLPHENOL 1 tonne per year	Inventory		
23	Spodrība 2004	Chemicals industry	Production of: - household chemistry - glues - industrial and institutional cleaners	2004	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
24	Liepāja WWTP	WWTP	More than 10 000 000 m3/ year	2005	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		
25	Jelgavas ūdens	WWTP	More than 2 695 800 m3/ year	2003	Yes (partly - for some preparations hazardous constituents are indicated, for some not)	No	Inventory		

Lithuania IPPC permit details

These are the only companies in the target sectors having IPPC
There is no possibility to check the permits oneself (there is no IPPC data base), information is provided from the Regional environmental department where the permit occurs.

No.	Installation or company	Branch	Target processes	Permit issued in (year)	Hazardous substances used, incl these in preparations (also mention if the topic is partially covered, e.g. preparations listed but no hazardius constituents indicated)	List of haz. substances includes HELCOM ones, which?	BAT measures related to use of hazardous chemicals	1. Does emission of HELCOM hazardous substances including dioxins, Cd, Hg occur (to air, water, wastes) 2.Is emission in accordance with EU limit values	If not, any BAT measures foreseen
1	AB „Alytaus tekstilė“	Textile finishing	Cotton and synthetical strand processing, yarn manufacture, bleach, variegation, painting	2004 12 31	preparations listed but no hazardius constituents indicated	no	no	Cu, Cr (in accordance with EU limit values)	
2	UAB „Linas Nordic“	Textile finishing	Flax processing, yarn manufacture, bleach, variegation, dyeing	2005 12 29	preparations listed but no hazardius constituents indicated	no	no		
3	AB „Klaipėdos kartonas“	Producing paper and board	The company produces raw materials for production of carrugated board - Testliner and Fluting. Beside the main activity, Klaipedos kartonas SC also produces end products - cardboard boxes of different purpose with offset printing.	2005 12 23	preparations listed but no hazardius constituents indicated (chlorinated parrafins used untill 1990).	no	no		
4	UAB „Grigiškės“ N.Verkių cechas	Producing paper and board	manufacturer of toilet paper, paper towels, paper napkins, medical cellulose wadding, corrugated board, hardboard and painted hardboard (http://www.grigiskes.lt/)	2005 01 03	preparations listed but no hazardius constituents indicated	no	no		
5	UAB „Grigiškės“	Producing paper and board	manufacturer of toilet paper, paper towels, paper napkins, medical cellulose wadding, corrugated board, hardboard and painted hardboard (http://www.grigiskes.lt/)	2005 01 03	preparations listed but no hazardius constituents indicated	no	no		
6	AB „Kauno ketaus liejykla“	Steel	Cast iron production, partial and all mechanical treatment, primary covering and painting. (http://www.ketus.lt)	IPPC issuance is in process (some problmes always occur, but not related to HS), prevoius permit valid till 2006 12 31	preparations listed but no hazardius constituents indicated	no	no	Ni (in accordance with EU limit values)	
7	Lietkabelis	Cable coating	Isolated/enameled cables, covering wires with varnish.	2006 01 12	preparations listed but no hazardius constituents indicated	no	no	Cr, Cd, Pb (in accordance with EU limit values)	

Poland IPPC permit details

No.	Installation or company	1.Kind of installation, 2.products	Branch	Permit issued in (year)	Hazardous substances used, incl these in preparations (also mention if the topic is partially covered, e.g. preparations listed but no hazardius constituents indicated)	List of haz. substances includes HELCOM ones, which?	BAT measures related to use of hazardous chemicals	1. Does emission of HELCOM hazardous substances including dioxins, Cd, Hg occur (to air, water, wastes) 2.Is emission in accordance with EU limit values	If not, any BAT measures foreseen
1	Textile producer X *)	1.installation: cleaning, degreasing or dyeing of fibre or textile 2.products: textile (use: military textile, working clothes, bedclothes and tableclothes, furniture)	Textile finishing	29-06-2006	yes,	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	BAT measures described in application: inventory of chemical substances based on SDS, substitution of hazardous chemicals by less hazardous , used pigments do not contain APEO	no	
2	Zakłady Przemysłu Bawełnianego FROTEX S.A,	1.installation: weaving mill, textile finishing, dyeing 2.products: cotton-fabric, underwear, ready textile goods	Textile finishing	12-12-2006	yes	there is no list of chemical substances used in the IPPC application	BAT measures described in application: inventory of chmical substances based on SDS, substitution of hazardous chemicals by less hazardous	no	
3	Federal-Mogul Bimet S.A. Gdańsk	1. installation: electroplating 2. products: slide bearing, diesel tractors, ship-engines, industrial machinery and installations	Metal finishing	19-12-2006	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	General statements on BAT concerning: inventory of chemical substances based on SDS, storage	no	
4	Fabryka Lin i Drutu "DRUTMET" S.A.	1. installation: galvanic zink coating 2. products: steel ropes, steel wires, steel fibres, steel-polypropylene ropes	Metal finishing	24-07-2006	yes	hazardous substances used are listed in the IPPC application (names only); HELCOM substances not listed.	Only general description of BAT. Description does not refer to chemical substances	no	
5	ŚRUBENA UNIA S.A.	1. installation: digestion, HCl regeneration station, acid bath store, sewage-treatment plant 2. products: screws, bolts, nuts.	Metal finishing	?	yes	hazardous substances are listed in the IPPC application (names only); HELCOM substances not listed.	Only general description of BAT. Description does not refer to the chemical substances	no	

No.	Installation or company	1.Kind of installation, 2.products	Branch	Permit issued in (year)	Hazardous substances used, incl these in preparations (also mention if the topic is partially covered, e.g. preparations listed but no hazardius constituents indicated)	List of haz. substances includes HELCOM ones, which?	BAT measures related to use of hazardous chemicals	1. Does emission of HELCOM hazardous substances including dioxins, Cd, Hg occur (to air, water, wastes) 2.Is emission in accordance with EU limit values	If not, any BAT measures foreseen
6	FAGOR MASTERCOOK S.A.	1. installation: surface treatment of metal cases of the household appliances including chemical treatment, vanishing and powder painting. 2. products: cookers (gas, electric, gas-electric), washing machines, ovens, freezers, refirigerators	Metal finishing	115-12-2006	yes	hazardous substances used are listed in the IPPC application (names only); HELCOM substances not listed.	General statmeents on BAT concerning: storage, substitution and control of use	no	
7	International Paper Kwidzyn S.A.	1.installation: pulp and paper production 2. products: paper, cardboard, bleached pulp	Pulp and Paper	11-04-2006	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	BAT measures described in application: inventory of chmical substances based on SDS, substitution of hazardous chemicals by less hazardous	no	
8	Arctic Paper Kostrzyn S.A.	1. installation: paper production 2. products: paper (rag paper, graphic paper)	Pulp and Paper	08-12-2005	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	General statments on BAT concerninig: storage, data set about substances used in process	no	
9	ALSTOM Power Sp z o.o. - Zakład Metalurgiczny	1.installation: melt and casting of non-ferrous metals, secondary melt of ferrous metals 2.products: cast from steel and bronze	Smelters	30-06-2005	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	General statments concerinig:inventory of chemical substances based on SDS, storage	no	
10	Ferrex Sp z o.o.	1.installation: production of cast iron products 2.products:grey cast iron and ductile cast iron in sand and metal moulds	Smelters	??	yes	hazardous substances are listed in the IPPC application (names only); HELCOM substances not listed.	BAT measures described in application: substitution of hazardous substances by less hazardous, storage	no	
11	Huta Buczek Sp z o.o.	1.installation: line for preparation of metalic charge and melt of cast steel and cast iron, preparation of mould, casting 2.products: cast steel and cast iron	Smelters	??	not mentioned in the IPPC application	there is no list of chemical substances used in the IPPC application	No reference to BAT, only to ISO 9001:2001.	no	

No.	Installation or company	1.Kind of installation, 2.products	Branch	Permit issued in (year)	Hazardous substances used, incl these in preparations (also mention if the topic is partially covered, e.g. preparations listed but no hazardius constituents indicated)	List of haz. substances includes HELCOM ones, which?	BAT measures related to use of hazardous chemicals	1. Does emission of HELCOM hazardous substances including dioxins, Cd, Hg occur (to air, water, wastes) 2.Is emission in accordance with EU limit values	If not, any BAT measures foreseen
12	Zakłady Chemiczne ORGANIKA SARZYNA S.A.	1.installation: production of organic half-products and other chemicals 2.production: resins, polyester resins, epoxide resins, hardening agents for epoxide rasins, MCPA i MCPP, ortophenylodiamine-o-FDA, phenolo-formaldehyde, bonders concentrates	Chemical Industry	31-10-2006	yes	there is no list of chemical substances used in the IPPC application	General statements on BAT concerning: inventory of chemical substances based on SDS, storage	no	
13	Plastics producer X *)	1. installation: production of chemical half-prodcuts and products, plastic processing 2.products: amins, phenols, formalin, polyester resins,	Chemical Industry	02-01-2007	yes	hazardous substances used are listed in the IPPC application; HELCOM substances: nonyphenol	Only general description of BAT. Description does not refer to chemical substances	no	
14	Zakłady Azotowe Anwil	1. CHP plant	Chemical Industry	22-12-2005	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	Only general description of BAT. Description does not refer to chemical substances	1. yes (dioxin, furnas, Hg, Cd in sewage) 2. yes	
15	Zadkłady Azotowe Puławy	1.instalation: production of chemical half-products and products 2.products: saltheters, carbamide, hydroden preoxide, liquid carbon dioxide	Chemical Industry	31-12-2004	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	Only general description of BAT. Description does not refer to chemical substances	no	
16	Wytwórania Pianek Poliuretanowych Sp. z o.o.	1.installation: production of chemical half-products a nd products 2. products: PUR foam profiles	Chemical Industry	09-06-2006	yes	there is no list of chemical substances used in the IPPC application	General statements on BAT concerning: storage, substitution	no	

No.	Installation or company	1.Kind of installation, 2.products	Branch	Permit issued in (year)	Hazardous substances used, incl these in preparations (also mention if the topic is partially covered, e.g. preparations listed but no hazardius constituents indicated)	List of haz. substances includes HELCOM ones, which?	BAT measures related to use of hazardous chemicals	1. Does emission of HELCOM hazardous substances including dioxins, Cd, Hg occur (to air, water, wastes) 2.Is emission in accordance with EU limit values	If not, any BAT measures foreseen
17	Zakłady Chemiczne ZACHEM S.A.	1. installation: electrolysis of brine, production of chemical half-products and products 2. products: chlorine (gas), phosgene, DNT, TDA, TDI, epichlorohydrin, PUR foams,	Chemical Industry	29-12-2006	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	Only general description of BAT. Description does not refer to chemical substances	no	
18	Vita Polymers Poland Sp. z o.o. (Instalacja do produkcji pianek poliuretanowych)	1. installation: production of chemical half-products and products 2. products: two types of polyurethane foam (used in furnitures, car, cosmetic industry)	Chemical Industry	17-07-2005	yes	hazardous substances are listed in the IPPC application (names only); HELCOM substances not listed.	Only general description of BAT. Description does not refer to chemical substances	no	
19	Ostrzeszowskie Zakłady Chemii Gospodarczej POLLENA	1. installation: production of organic chemical products 2. produts: soap	Chemical Industry	01-02-2007	yes	there is no list of chemical substances used in the IPPC application	General statments on BAT concerinig: substitution	no	
20	PCC Rokita (instalacja uniepalniaczy	1.installation: production of chemical half-products and products 2.products: flame retardants, plastifiers, non-ionic surphactants	Chemical Industry	29-12-2006	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	General statments on BAT concerninig proceses with use of etylen oxide, propylen oxide	no, Hg was measured from 1988-200, in 2001 measurment were stopped becouse values were very low or not detectable	
21	Gdańskie Zakłady Nawozów Fosforowych "Fosfory" Sp z o.o.	1.installation: production of chemical half-products and products 2. products: sulphuric acid, phosphoric acid, mineral fertlizers	Chemical Industry (fertilizers)	29-12-2006	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	Only general description of BAT. Description does not refer to chemical substances	no	
22	Zakłady Azotowe Kędzierzyn S.A./ Jednostka Biznesowa Nawozy	1. installation: production of chemical half-products and products, 2. products: nitric fertilizers, NH3, nitric acid, anhydride of phthalate acid, anhydride of maleate acid, formalin, alcohols	Chemical Industry (fertilizers)	29-12-2007	yes	hazardous substances used are listed in the IPPC application; HELCOM substances not listed	General statments on BAT concerning: inventory of chemical substances based on SDS	no	

No.	Installation or company	1.Kind of installation, 2.products	Branch	Permit issued in (year)	Hazardous substances used, incl these in preparations (also mention if the topic is partially covered, e.g. preparations listed but no hazardius constituents indicated)	List of haz. substances includes HELCOM ones, which?	BAT measures related to use of hazardous chemicals	1. Does emission of HELCOM hazardous substances including dioxins, Cd, Hg occur (to air, water, wastes) 2.Is emission in accordance with EU limit values	If not, any BAT measures foreseen
23	Zakłady Chemiczne ORGANIKA SARZYNA S.A.	1.installation: production of organic half-products and other chemical 2.production: pesticides, biocides	Chemical Industry (pesticides and biocides)	31-10-2006	yes	there is no list of chemical substances used in the IPPC application	General statements on BAT concerning: inventory of chemical substances based on SDS, storage	no	
24	Zakład Doświadczalny "ORGANIKA" Sp z o.o.	1.installation: production of chemical half-products and products 2.products: pesticides and other chemicals used in agriculture, organic chemicals	Chemical Industry (pesticides and biocides)	??	yes	hazardous substances are listed in the IPPC application (names only); HELCOM substances not listed.	Only general description of BAT. Description does not refer to chemical substances	no	
*) information on hazardous substances were given in the confidential part of the IPPC applications. Therefore it is not possible to relate the data with the name of the applicant.									

ANNEX A.4

Permitting System and Hazardous substances

Definition of PBT-like substances

Country	Definition for a „dangerous substance"	Definition for a WFD „hazardous substance"	Status of List 1 and 2 substances of EU WFD
Estonia	Definition for a „dangerous" (or „hazardous") substance is given in the Chemicals Act § 5 (1). NOTE: There is only a single word for „hazardous" and „dangerous" in Estonian language.	Water Act, § 26[5] (1) gives definition of a „hazardous" substance with reference to toxicity, persistency and bioaccumulation, but not giving any quantitative specifications.	Adopted by regulation of Ministry of Environment from 2001. For some list 2 substances reference is given „substance regulated by HELCOM", also link to the text of Convention is given. [This reference should be more visible, e.g. given in the beginning of the regulation, not as a footnote in the end]
Latvia	Chemicals law legally defines „dangerous" (or „hazardous") substance. NOTE: In Latvian language here is a single word for „hazardous" and dangerous" Bīstamās ķīmiskās vielas !	Law on water management gives gives definition of a „hazardous" substance with reference to toxicity, persistency and bioaccumulation. 2 definitions are given _ **Priority substances -** chemicals which pose substantial risk to water environment**.** **Priority hazardous substances** — chemicals, which are toxic, persistent in environment and bioaccumulate, also other sustances of similar concern.	Adopted by several regulations: - Provisions of Cabinet of Ministers **No. 34** 2002 Provisions on emissions of polluting substances to water - Provisions of Cabinet of ministers **Nr. 858**, 2004 Provisions on surface water objects characterization, classification, quality criteria and determination of anthropogenic loads
Lithuania	Definition for a „dangerous" (or „hazardous") substance is given in the Chemical substances and Preparations Act. NB! There is single word for „hazardous" and „dangerous" in Lithuanian language -pavojingos medžiagos.	Water Act, gives definition of a „hazardous" substance with reference to toxicity, persistency and bioaccumulation, but not giving any quantitative specifications.	Adopted by regulation of Ministry of Environ-ment from 2001, came into force in 2002 02 09.
Poland	Definition for a „dangerous substance (substancja niebezpieczna) is given in Act on chemical substances and preparations art 2 p. 2.	WFD hazardous substances are called "substances particularly hazardous for aquatic environment"(substanacje szczególnie szkodliwe dla środowiska wodnego". They are defined in Decree of Minister of Environment of 24/07/2006 on the conditions for discharging wastewater to waters or ground and substances particularly hazardous for aquatic environment.(Dz. U. no. 137, item 984).	Decree of Minister of Environment of 24/07/2006 on the conditions for discharging wastewater to waters or ground and substances particularly hazardous for aquatic environment.(Dz. U. no. 137. item 984) includes List 1 (to be eliminated) and List 2 (to be minimized). For most of them ELV have been set.

Country	Definition for a „dangerous substance"	Definition for a WFD „hazardous substance"	Status of List 1 and 2 substances of EU WFD
Russia	Definition of "hazardous substances" is given in annex 1 to the Federal law № 116-FZ "About industrial safety of dangerous industrial objects" dated by 21.07.1997. However, there is different type of substances called "dangerous" (Federal law № 7-FZ "About environmental protection" 10.01.2002) which are simply exceeding limit values and may cause an impact on the environment. So, this leads to misunderstanding and wrong interpretation of the HS as such.	No. However, new Water Code (2006) is having unclear references to „radioactive substances, pesticides, agrochemicals and other hazardous substances"in its articles.	no

EU legislation requirements from 1) authorities; 2) companies (BREF, IPPC)

IPPC Directive stipulates in Article 3 that „the competent authorities ensure that installations are operated in such a way that:
(a) all the appropriate preventive measures are taken against pollution, in particular through application of the best available techniques;
(b) no significant pollution is caused;"

In Article 6 requirements for permit applications are set:
"1. Member States shall take the necessary measures to ensure that an application to the competent authority for a permit includes a description of:
— the installation and its activities, — the raw and auxiliary materials, other substances and the energy used in or generated by the installation, …"

In Article 9 content of permit conditions is given:
3. The permit shall include emission limit values for pollutants, in particular, those listed in in Annex III, likely to be emitted from the installation concerned in significant quantities, having regard to their nature and their potential to transfer pollution from one medium to another (water, air and land) … Where appropriate, limit values may be supplemented or replaced by equivalent parameters or technical measures.

4. Without prejudice to Article 10, the emission limit values and the equivalent parameters and technical measures referred to in paragraph 3 shall be based on the best available techniques, without prescribing the use of any technique or specific technology, but taking into account the technical characteristics of the installation concerned, its geographical location and the local environmental conditions. ..."

More detailed extracts of IPPC Directive are given in Annex I.

In general, there is no clear indication for applicant in the text of Directive to include hazardous substances (rather it can be interpreted "all materials including all substances used") and to consider substances in preparations (latter statement is valid if you do not know details of chemicals legislation in EU). For competent authority there is a clear link to consider Water Framework Directive (substances to be considered while setting emission limit values for discharge into water in Annex III of IPPC Directive are the same considered as indicative list of pollutants in Annex VIII of WFD), but there is no explanation for "significant quantities" in the Directive.

The emission limit values (ELV) shall be based on the best available techniques (BAT), but at the same time it is clearly written in prefaces of EU BAT guideline documents (BREFs) that ELVs given have only indicative value. Often none of hazardous substances of concern are mentioned in specific BREF, and hazardous substances can be addressed in the BREF documents in different ways.

Selected relevant BREFs referring to chemicals:

PULP and PAPER
- Inventory (including composition and PBT profile) is BAT
- Substitution of hazardous chemicals by less hazardous is BAT
- Overview on paper chemicals by functionality and environment profile in annex I
- Suppliers responsibility to characterise the fate of his products paper making process (p.378)

TEXTILE
- Inventory [data base], including composition and PBT profile) is BAT
- Substitution of hazardous chemicals by less hazardous is BAT [term "harmful" is actually used]]

- Overview on textile chemicals by functionality in the summary
- List of hazardous substances (including APEOs, chlorinated paraffins, PBDPE) [p12]

TANNING
- Inventory of inputs and outputs of chemicals, their fate in processes and releases is BAT
- Substitute less harmful chemicals for agents and auxiliaries that are known to be harmful to the environment is BAT
- NPEs to be substituted with alcohol ethoxylates, where possible, and brominated flame retardants to be substituted with phosphate-based flame retardants
- No specific emission limit values except for chromium and sulphides. [pp 169 – 171]
- In Chapter 4.1 is given detailed overview of substitution possibilities.

SURFACE TREATMENT OF METALS
- It is a general BAT to use less hazardous substances (5.2.5)
- Chapter 5.2.5.2. gives BAT description if PFOS are used*, 5.2.5.6 for Cd.
- No specific emission limit values for substances of concern (except heavy metals)
- In Chapter 1.4.4 is given detailed overview of substances of concern, including metals and surfactants (NP/NPEs, PFOS), chapter 4.9 is giving review of substitution possibilities

* For PFOS, it is BAT to minimise its use by controlling additions, minimising fumes to be controlled by techniques including floating surface insulation sections: however, occupational health may be an important factor. It can be phased out in anodising and there are alternative processes to hexavalent chromium and alkali cyanide-free zinc plating.

LARGE COMBUSTION PLANTS
- No requirements related to hazardous substances in fuels

POLYMER INDUSTRY
- No requirements related to additives

IRON and STEEL
- No requirements related to quality of scrap input in order to avoid formation of dioxins

FERROUS and NON-FERROUS Metals
- Emission limits for metals
- Grease and lubricants mentioned as source of hydrocarbon emission but additives not addressed at all.

From given examples is clear that BREFs are not consistent in terminology – terms “harmful” and “hazardous” substances are used but without specific references or explanations.

EU legislation requirements for substances in WFD, marketing and use

Table below gives overview of coverage of target hazardous substances is given in EU legislation. Background extracts from Water Framework Directive are given in Annex II, marketing and use restrictions in Annex III, PIC procedure (export notification, etc.) in annex IV.

Substance	WFD lists			Date of restriction[1]	Type of restriction[2]
	Priority haz. Substance	EU ELV	EU EQS		
Tributyltin compounds (TBT)	+			12.7.2002 (organostannic compounds)	i(2), sr p(2), sr
Triphenyltin compounds (TPhT)					
Pentabromodiphenyl ether (pentaBDPE)	+			15.2.2003 (31.3.2006 in aircraft emer-gency sys-tems)	i(1), sr
Octabromodiphenyl ether (octaBDPE)					i(1), sr
Decabromodiphenyl ether (decaBDPE)					
Hexabromocyclo-dodecane (HBCDD)					
Perfluorooctane sulfonate (PFOS)					
Perfluorooctanoic acid (PFOA)					
Nonylphenol (NP)	+			17.7.2003	i(1), sr
Nonylphenol ethoxylates (NPE)					i(1), sr p(1)-p(2), b-b
Octylphenol (OP)	+				
Octylphenol ethoxylates (OPE)					
Short-chain chlorina-ted paraffins (SCCP)	+			6.7.2002	
Medium-chain chlo-rinated paraffins (MCCP)					
Endosulfan	+		?		p(1), b

1 Date of publishing in Official Journal;

2 Sub-categories: p(1) – pesticide in the group of plant protection products, p(2) – other pesticide including biocides. i(1) - industrial chemical for professional use, i(2) – industrial chemical for public use; Use limitations: sr - severe restriction, b – ban (for the sub-category or sub-categories concerned). See **Annex III** for details of restriction.

Substance	WFD lists			Date of restriction[1]	Type of restriction[2]
	Priority haz. Substance	EU ELV	EU EQS		
Cadmium and compouns	+	As in directice 83/153/EEC	As in directice 83/153/EEC	12.7.1991	i(1), sr
Mercury and compounds	+	As in directice 84/156/EEC	As in directice 84/156/EEC	30.12.1989	p(1)-p(2), b-sr
Dioxins and furans (PCDD/PCDF)					

Coverage of target HELCOM hazardous substances in national legislation

ESTONIA

Substance	Priority h. sub[1]	Use restrictions		ELVs	EQS		
		In articles[2]	Other[3]	mg/l	Surface water[4] µg/l	Ground water[5] µg/l	Soil[5] mg/kg
Tributyltin compounds (TBT)	List 2		+	(0,5)[6,7] as Sn	Listed, no limit value	(3 / 150) as Sn	(10/300) as Sn
Triphenyltin compounds (TPhT)			+				
Pentabromodiphenyl ether (pentaBDPE)		+	+				
Octabromodiphenyl ether (octaBDPE)			+		Listed, no limit value		
Decabromodiphenyl ether (decaBDPE)		+ (less strict)					
Hexabromocyclo-dodecane (HBCDD)							
Perfluorooctane sulfonate (PFOS)							
Perfluorooctanoic acid (PFOA)							
Nonylphenol (NP)			+		Listed, no limit		
Nonylphenol ethoxylates (NPE)			+				
Octylphenol (OP)					0,005		
Octylphenol ethoxylates (OPE)							
Short chain chlorinated paraffins (SCCP)				(1,0) as AOX	Listed, no limit	(1 / 70) for chlorinated aliphatics	(0,1 / 50) for chlorinated aliphatics
Medium chain chlorinated paraffins (MCCP)							
Endosulfan	List 2		+		0,003	0,5 / 5 (sum of pesticides)	0,5 / 20 (sum of pesticides)
Cadmium and compounds	List 1	+	+	0,2[6,7] +[8,9]	5	1 / 10	1 / 20
Mercury and compounds	List 1	+	+	0,05[6,7] +[8,9]	1	0,4 / 2	0,5 / 10
Dioxins and furans (PCDD/PCDF)				+[9]			

[1] Regulation of Ministry of Environment No 44 from August 21 2001

a) There is no clear definition of List 1 and List 2 (except discharge of List 1 substances should be avoided, discharge of List 2 substances should be limited by appropriate means), but the criteria for List 1 are the same as for EU priority hazardous substances, List 2 seems to be EU candidate hazardous substances. Only these substances are indicated in table which are specifically indicated in the lists

b) The regulation should be reviewed after 4 year periods [but until now it is not done – this explains why there are no other EU priority hazardous substances]

c) see also text in Chapter 6 "Does environmental permitting addresses hazardous substances?"

[2] Governmental Regulation No 154 from July 6 2006, enforcing all limitations for certain substances in "problematic products" according to EU waste legislation (Cr^{VI}, PBDE, PBB, Pb, Cd, Hg)

[3] EU marketing and use restrictions are automatically applied, there are no other specific regulations in Estonia

[4] Regulation of Ministry of Environment No 17 from March 11 2005

There are separate EQS for surface water and sea water. Surface water EQS are given in the table

If there is no limit value for listed compound, it is meaning that concentration shall be below detection limit

[5] Regulation of Ministry of Environment No 12 from April 2 2004

a) There are different EQS values: in the regulation: target value (if concentration is less – good environmental quality, no hazards for environment and human health), limit value – if exceeded, environment is polluted, i.e. hazards for environment and human health exist. First number is target value, second number limit value.

b) In case of soil there are separate limit values for industrial areas and dwelling areas. Limit values for industrial areas are shown in the table.

c) The regulation states that for these hazardous substances EQS values are not stated, environmental quality for a site is defined by expert assessment. Expert assessment is given in case there is reason to suspect contamination from previous / ongoing activities on the site.

[6] Governmental regulation No 269 from July 31 2001 enforces emission limit values for discharge of certain hazardous substances into water bodies and ground water. Discharge limits of certain hazardous substances into municipal sewery are enforced by Regulation of Ministry of Environment No 75 from October 16 2003 (same ELVs are applied, ELVs in HELCOM recommendations are followed).

[7] According to Governmental regulation No 269 from July 31 2001, discharge of wastewater icontaining the pollutant into soil is prohibited.

[8] Regulation of Ministry of Environment No 76 from October 16 2003

Enforces EU limit values for Hg, Cd and some other hazardous substances in case of certain production processes – WFD Annex IX; [but there are no such industries in Estonia …]

[9] Other sector specific emission limit values from legislation (i.e. waste incinerators - both air and water, large combustion plants – air)

LATVIA

Substance	Priority haz. sub.*	Hazardous substances **	Use restrictions***		ELVs Emission limit values** mg/l	EQS Environmental quality standards****		
			articles	Other		Surface water µg/l	Ground water µg/l	Soil mg/kg
Tributyltin compounds (TBT)		+		+		0,01		
Triphenyltin compounds (TPhT)		+						
Pentabromodiphenyl ether (pentaBDPE)		+		+				
Octabromodiphenyl ether (octaBDPE)								
Decabromodiphenyl ether (decaBDPE)								
He+abromocyclo-dodecane (HBCDD)								
Perfluorooctane sulfonate (PFOS)								
Perfluorooctanoic acid (PFOA)								
Nonylphenol (NP)		+		+				
Nonylphenol ethoxylates (NPE)								
Octylphenol (OP)		+						
Octylphenol ethoxylates (OPE)								
Short chain chlorinated paraffins (SCCP)		+		+				
Medium chain chlorinated paraffins (MCCP)								
Endosulfan								
Cadmium and compounds	+			+	0,2 mg/l	5,0	1,0	
Mercury and compounds	x			x	From chlor-alkali electrolysis industry – 0,5 mg/l In other industry 0,05 mg/l	1,0	0,2	
Dioxins and furans (PCDD/PCDF)								

*Provisions on surface water objects characterization, classification, quality criteria and determination of anthropogenic loads, Nr. 858

** Provisions on emissions of polluting substances to water, Nr. 34

*** Provisions on use and marketing restrictions and bans of dangerous chemical substances and products (specific types of uses are described), Nr. 158
****Provisions on surface and ground water quality, Nr. 118
ELV - total average concentration per month in waste water
EQS:
For surface water – maximum allowable concentration in average in year
For ground water- target value

LITHUANIA

(AA-MAC – Maximum allowable concentration expressed as an annual average value)

Substance	Priority haz. sub.[3]	Use restrictions		ELVs mg/l		EQS		
		articles[4]	other[5]			Surface water µg/l	Ground water mg/l	Soil mg/kg[6]
				AA-MAC to sewerage system[7]	AA-MAC to the environment[8]	AA-MAC in the environment[9]	AA-MAC in the groundwater[10]	
Tributyltin compounds (TBT),	List 2		+	0,4	0,02	0,001		
Triphenyltin compounds (TPhT)			+					
Pentabromodiphenyl ether (pentaBDPE)	List 2		+	Not listed	Not listed	0,1		
Octabromodiphenyl ether (octaBDPE)			+					
Decabromodiphenyl ether (decaBDPE)								
Hexabromocyclo-dodecane (HBCDD)								
Perfluorooctane sulfonate (PFOS)								
Perfluorooctanoic acid (PFOA)								
Nonylphenol (NP)	List 2		+	Not listed	Not listed	Not listed		
Nonylphenol ethoxylates (NPE)			+					
Octylphenol (OP)	List 2			Not listed	Not listed	Not listed		
Octylphenol ethoxylates (OPE)								

3 Order No. D1-236 of the Lithuanian MoE on wastewater treatment regulation of 17 May 2006.

4 Order No. 239 of the Lithuanian Ministry of Health on Hygiene standarts 36 : 2002 on banned and restricted substances of 27 May 2002 (an application of EC Directive on Bans and Marteking and Use Restrictions (76/769/EEC). It is also referd to articles, for ex., „It is banned to use articles, containing Hg".

5 Order No. 239 of the Lithuanian Ministry of Health on Hygiene standarts 36 : 2002 on banned and restricted substances of 27 May 2002 (an application of EC Directive on Bans and Marteking and Use Restrictions (76/769/EEC).

6 Order No. V-114 of the Lithuanian Ministry of Health on Hygiene standarts 60:2004 on hazardous substances' maximum allowable concentration in soil of, 8 March 2004.

7 Order No. D1-236 of the Lithuanian MoE on wastewater treatment regulation of 17 May 2006.

8 Order No. D1-236 of the Lithuanian MoE on wastewater treatment regulation of 17 May 2006.

9 Order No. D1-236 of the Lithuanian MoE on wastewater treatment regulation of 17 May 2006.

10 Numbers in the left – groundwater for drinking and sanitary purposes, numbers in brackets – groundwater, neither used for drinking nor sanitary purposes.

Substance	Priority haz. sub.[3]	Use restrictions		ELVs mg/l		EQS		
		articles[4]	other[5]			Surface water µg/l	Ground water mg/l	Soil mg/kg[6]
				AA-MAC to sewerage system[7]	AA-MAC to the environment[8]	AA-MAC in the environment[9]	AA-MAC in the groundwater[10]	
Short chain chlorinated paraffins (SCCP)								
Medium chain chlorinated paraffins (MCCP)			+					
Endosulphane	List 2		?	Not listed	Not listed	0,001	0,0001(0,0001)	
Cadmium and compounds	List 1		+	0,1	0,04	5	0,005(0,01)	3
Mercury and compounds	List 1		+	0,01	0,002	1	0,001(0,001)	1,5
Dioxins and furans (PCDD/PCDF)								

POLAND

Substance	Priority haz. sub.[1]	Use restrictions		ELVs [4] mg/l		EQS		
		articles[3]	other[3]			Surface water[5] µg/l	Ground water[6] µg/l	Soil[7] mg/kg
Tributyltin compounds (TBT)	X	-	+[2]	2 [4a] as Sn 1 [4b] as Sn		-	-	20-350
Triphenyltin compounds (TPhT)	-	-	+	-		-	-	-
Pentabromodiphenyl ether (pentaBDPE)	X	-	+	-		-	-	-
Octabromodiphenyl ether (octaBDPE)	-	-	+	-		-	-	-
Decabromodiphenyl ether (decaBDPE)	-	-	-	-		-	-	-
Hexabromocyclo-dodecane (HBCDD)	-	-	-	-		-	-	-
Perfluorooctane sulfonate (PFOS)	-	-	-	-		-	-	-
Perfluorooctanoic acid (PFOA)	-	-	-	-		-	-	-
Nonylphenol (NP)	X	-	+	-		-	-	-
Nonylphenol ethoxylates (NPE)	-	-	+	-		-	-	-
Octylphenol (OP)	potential	-	-	-			-	-
Octylphenol ethoxylates (OPE)	-	-	-	-		-	-	-
Short chain chlorinated paraffins (SCCP)	X	-	+	5 mgCl/l [4c] 1mgCl/l [4d]		-	-	0,01 – 60 (sum of chlorinated aliphatic)
Medium chain chlorinated paraffins (MCCP)	-	-	-	0,5mgCl/l [4e]		-	-	
Endosulfan	X	-	-	-		0,001-0,0025 mg/l [5b] (sum pesticides)		-
Cadmium and compouns	X	+	+	0,06 -02 [4f]	0,05 ng/l [4g]	0,03 mg/l [5a]	0,001-0,005 mg/l [5b]	1-20
Mercury and compounds	X	-	+	0,05 - 0,4 [4f]	0,03 ng/l [4g]	0,005 mg/l [5a]	0,0005 - 0,001 mg/l [5b]	0,5 – 50
Dioxins and furans (PCDD/PCDF)	-	-	-	0,3 ng/l [4g]		-	-	-

[1] Decree of Minister of Environment from 10 November 2005 on list of priority substance in water management; Dz. U. no. 255, item 1987) - on base Act of Water Law art.38 par.4, identical to Annex X to WFD.
[2] Act on Water Law (Dz. U. 2001 No 115, item 1226 with later changes), Act.40 par.1 p.6, It is forbidden to use paints manufacture on base of organic tin compounds (TBT) to preservation of technical underwater constructions.
[3] Decree of Minister of Economy and Work from 5 July 2004 on restrictions, bans or production conditions, trade turn-over or use of hazardous substances and preparations, and products which contain them (Dz.U. No 168, item. 1762), it implements into polish law 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 with its later changes
[4] Decree of Minister of Environment from 24 July 2006 on conditions which should be fulfill at introducing sewage into water or ground, and priority substances which cause water pollution (Dz.U. 2006 No 137, item 984)
[4a] other types of sewage
[4b] sewage from coating paints and vanish resins production
[4c] production of bleach celluloid mass, sulfate IV and VI
[4d] other types of sewage
[4e] applies to milk processing, fruit and vegetables processing and production, soft drinks production and bottling, grain and potatoes processing, farm animals breeding and meat processing or production, brewery, alcohol and alcoholic liquors production only sewage from distillery), fish processing
[4f] quantity depends on type of production, it is quantity average for 24h, given quantities will be in force from 01.01.2008
[4g] for sewage from flue gases from waste incineration
[5a] Decree of Minister of Health from 16 October 2002 on requirements for water in watering-place
[5b] Decree of Minister of Environment from 27 November 2002 requirements for surface waters used to supply population in water destine to consumption (Dz.U. No 204, item 1728), values depends on category of water
[6] standards not published yet
[7] Decree of Minister of Environment from 9 September 2002 on quality standards of soil and ground (DZ. U. No 165, item 1359) values depends on type of region, depth and water permeability of ground

Description of environmental permitting system

Only IPPC installations and water discharge permits / discharge into municipal sewery are covered.

ESTONIA

In **Estonia** IPPC permitting system was added to already existing permitting system of air, water and waste permits (further referred as „single media permits"). There was no changes in procedures of single media permitting system due to introduction of IPPC. Both type of permits are issued by County Environmental Departments of Ministry of Environment.

Since introduction of IPPC permitting in 2002, there have been mutual influence of the content of permit applications / permits. IPPC permit templates have most influenced air permitting system.

In 2006 it was decided that air, water and waste chapters in IPPC permit applications / permits shall be processed according to single media permit template tables. As a result, requirements for wastewater discharge issues in IPPC permits became less strict (discharge to municipal seweries is not thoroughly considered any more).

Type of permit	Installations covered	Permit issued by	Validity period and availability	Legally defined templates	BAT	Number of installations
IPPC	EU IPPC Directive Annex I type of installations and threshold capacities are taken over. Some addition-nal activities (plywood and fibreboard production, cattle farms) and also more stringent capacities are considered (solvent use 50 t/a instead 200 t/a, certain hazardous waste management units)	County Environmental Departments (CED) of Ministry of Environment (15 counties)	No termination date. Annual review of conditions shall be done by CED. Any planned change in activity shall be reported to CED prior implementing the change. Issued permits are available in Internet: in Environmental Permits Information System [it is not always the case due to some specific problems with the system]	Permit application and permit content are defined by regulation of MoE. There are 15 chapters in an IPPC application, one of them on use of raw materials and chemicals. Both text and pre-defined tables templates shall be used in application. Tables and principles used in air, water and waste chapters are the same as in single media permitting system. Permit consists only of pre-defined templates (tables). All the conditions should be fitted into these tables.	Applicant has to compare its activities with relevant EU BREF and other available guidelines. There is a specific table for that. The same table is used in permit. [But it is not so clear what is the extent of comparison, both for applicants and also for CEDs] For some installations local BAT guidelines have been developed (plywood and fibre-board; oil-shale processing, cattle farms)	Industry: **37** (in addition: agriculture 50 waste: 13 energy: 15)

Type of permit	Installations covered	Permit issued by	Validity period and availability	Legally defined templates	BAT	Number of installations
Wastewater discharge	Any installation discharging wastewater and any other pollutants directly into environment (into surface water, sea, soil, ground water). If wastewater is discharged to municipal sewery, there is no waste-water discharge permit for the installation. Overall permit is issued for the company responsible for the operation of the sewery.	County Environmental Departments (CED) of Ministry of Environment (15 counties)	Valid up to 5 years Permit shall be changed if there are changes in legal requirements or there is evidence of substantial environmental impacts from permitted activity. Issued permits are available in Internet: in Environmental Permits Information System	Permit application and permit content are defined by regulation of MoE. Both text and pre-defined tables templates shall be used in application. In case of discharge of hazardous substances in List 1 – plans for elimination of substance from waste water, investi-gation of possible impacts to water environment; List 2 – plan for minimisation. Permit consists only of pre-defined templates (tables). All the conditions should be fitted into these tables.	Comparison with BAT required in application, if possible (i.e. BAT information available) There is no definition of BAT in water legislation nor reference to IPPC	Number of issued permits on wastewater discharge: ~1000 [1603 water permits which include also intake and other permits for activities influencing water]
Discharge to municipal sewery	Any installation discharging into municipal sewery	No permit – contract with operator of the sewery	As agreed with operator. Contract is not a public document	None, except statement in Water Act § 26[1] that hazardous substances discharged by client shall be reported to the operator, relevant conditions on they discharge set in contract (actually their nature is same as in wastewater discharge permit), and relevant conditions shall appear in the permit of the operator of municipal sewery.	Not mentioned	Not counted

Further details on hazardous substance issue in permits (ESTONIA)

Type of permit	Information on input materials in applications				Requirements in permits			Guidance available
	Requested	Segregation according to classification	Hazardous substances in preparations revealed	Contaminants considered	Assessment of environmental fate of substances in discharge	Requirements to phase out or substitute	Monitoring of hazardous substances	
IPPC	YES	YES	YES	NO	Same as in waste-water discharge	General BAT requirement + specific BREFs	If ELV in permit and monitoring condition set	General guidance only: http://www.envir.ee/ ippc
Wastewater discharge	NO	-	-	-	Data on amounts and concentrate-ions of emitted pollutants, on hazardous substances discharged into municipal sewery and which can not be treated in treatment plants*	List 1: plan for elimination from discharge List 2: plan for minimisation in discharge	If ELV in permit and monitoring condition set	NO
Discharge to municipal sewery	NO	-	-	-	(same as above)	(same as above)	If agreement foresees	NO**

* - without further explanation or reference

** but necessary as there is no reference on above mentioned issue in Municipal water supply and sewery Act, which is regulating the area

Does applications/permitting system in principal sufficiently addresses the hazardous substance issue? Yes, except defining the hazardous substances, obligation to give overview of all hazardous substances in use especially in water discharge permits. Guidance should be developed. The amount of information regarding hazardous substances in preparations should be limited only to those having relevance (i.e. VOCs for air, hazardous substances for water; full safety data sheet composition could be in annex of the application)

LATVIA

In **Latvia** IPPC permitting system is regulated by Provisions of Cabinet of Ministers „Order how to apply for A, B or C category permiting activity and how A and B category permits are issued". All polluting activities are divided according to categories A (largest, corresponds to IPPC), B (smaller, lower requirements, but form or permit very much corresponds to A category) and C (no permit required, only notification). Permits are issued by Regional environmental boards (under State Environmental Service) based on application from enterprise.
Single media issues – air, water, soil, etc. are included in permits.
In case WW are discharged in municipal seweries, the water emissions are not regulated by permit, but via contract between enterprise and WWTP. This leads to a situation, than only some of the water pollutants are monitored.

Type of permit	Installations covered	Permit issued by	Validity period	Legally defined templates	BAT issues	Number of installations
IPPC- A category in LAT legislation	EU IPPC Directive Annex 1 type of installations	Regional Environmental Boards	5 years	Permit application and permit content are defined by Provisions of cabinet of ministers „Order how to apply for A, B or C category permiting activity and how A and B category permits are issued". Permit consists of 8 chapters: Chapter A – overall characteristics, including the reference to legal acts according to which permit is issued B- production processes and technologies C- raw materials and chemicals, energy ad water D – Environmental pollution E- monitoring F- measures, which need to be taken in case installation is not operated anymore, in order to reduce impact to environment H- signatures part Permit consists of textual part and on predefined tables Chemicals are covered in part C and 2 predefined tables are: - Chemicals (substances and products) and other materials, which are	Comparison with BAT required in application, if possible (i.e. BAT information available)	**84** 23 – energy 3 – metal 7 - mineral production (includes also glass fiber production) 5 – chemicals industry 5- Waste management 41 -Other sectors (mainly pig farms and food industry)

Type of permit	Installations covered	Permit issued by	Validity period	Legally defined templates	BAT issues	Number of installations
				used as raw materials and auxiliary materials (TABLE – nr., chemicals (substance or product), type (e.g. organic substance, wood, etc.), use, tones of stored material, type of storage, used amount in year in tones); - Dangerous (hazardous) chemicals or products, which are used as raw materials, auxiliary materials or occurring in by products or final products (TABLE – Nr. , chemical substance or product, type of chemicals substance or product, use, CAS nr., hazard class, R and S phrases, stored amount in tones and type of storage , used amounts in tones per year)		
B category permits	According to Annex 1 of Provisions of cabinet of ministers „Order how to apply for A, B or C category permiting activity and how A and B category permits are issued".	same as above	same as above	- same as above	Not applicable	Only sectors of our interest named: Metal processing and treatment: 102 Mineral production: 24 (includes also glass production) Chemicals industry: 138 (includes also chemicals users, e.g. dry-cleaners, etc.) Other- include WWTP: A lot ☺

Type of permit	Installations covered	Permit issued by	Validity period	Legally defined templates	BAT issues	Number of installations
						WWT needs a permit if iit works with power more than 20m3 per day :

Further details on the hazardous substance issue in permits (LATVIA)

Type of permit	Information on input materials in applications				Requirements in permits			Guidance available
	Requested	Segregation according to classification	Hazardous substances in preparations revealed	Contaminants considered	Assessment of environmental fate of substances	Requirements to phase out or substitute	Monitoring of pollutants	
IPPC	YES	YES Substances (products) which are clasified as dangerous, are in separate table	Not requested	No	Characterization of emissons to environment: - physical charazcterization of emission sources - emissions to air - emissions from non-organized emission sources and odours emission limit project - emissions to waste waters - direct emissions to water - emissions to other operator WWTP -noise - waste and activities - waste gathering and transport - waste utilisation	**In GUIDELINES:** **In application process an environmental plan must be submitted which requires also description on planned substitution of chemicals** **However if installation complies with environmental legislation and BAT, plan is not required** CHEMICALS LAW: Requirement is set also in Chemicals Law 3rd Chapter obligations of actor, paragraph 9. part 2: (2) Actor should	Yes Part E – monitoring	http://www.vvd.gov.lv/dokumenti.php?sid=met

Type of permit	Information on input materials in applications				Requirements in permits			Guidance available
	Requested	Segregation according to classification	Hazardous substances in preparations revealed	Contaminants considered	Assessment of environmental fate of substances	Requirements to phase out or substitute	Monitoring of pollutants	
						(must)(in Latvian Jāizvairās) avoid from working with such chemicals , which are classified as dangerous, if there are available less dangerous substitutes.		
B category permits	YES	YES Substances (products) which are clasified as dangerous, are in separate table	Not requested	No	The same as above,		Yes Part E – monitoring	http://www.vvd.gov.lv/dokumenti.php?sid=met

Does applications/permitting system in principal sufficiently addresses the hazardous substance issue?

As it is not requested to disclose hazardous substances and not to consider contaminants, situation is such that often product names are listed, which doesn't give sufficient information on hazardous components.

Legislation (Provisions of Cabinet of ministers nr. 294) on permits has a paragraph Nr. 10, which says „If a certain point in application doesn't apply to A or B category polluting activity, operator doesn't fill in. In case there is a doubt, operators consult with Regional Environmental board, which gives a conclusion" (THIS IS NOT CONTAINING IMPLEMENTATION ISSUES, ONLY PRINCIPLES OF THE SYSTEM CONSIDERED).

LITHUANIA

- IPPC issue regulated by: Order of the Minister of Environment No. 80 of 27 February 2002, changed by No. D1-330 of 29 June 2005.
- IPPC permits are obligatory:
  - to industrial activities included in Annex I of IPPC Directive.
  - installations, exceeding certain criteria, listed in Annex II (national annex).
- Permits issued by both annexes are called IPPC.
- Water issues are covered by Annex II. Water users should have IPPC permit and provide annual statistical reports if they:
  - Abstract ≥ 10 m3/day of water,
  - Discharge ≥ 5 m3/day of domestic or industrial wastewater to the environment.
  - Discharge hazardous substances.
  - Discharge surface water run-off from certain areas.
- In case wastewater is discharged in municipal seweries IPPC permit is not needed, but a contract with the operator of the sewerage system.
- But WWTP, having a permit, must report provide a list of enterprises, discharging > 50 m3 of wastewater per day to their sewerage system.
- IPPC permits are issued by Regional Environmental Protection Departments (REPDs) under the Ministry of Environment. There are 8 REPDs in Lithuania.

(Note that this is one permit – IPPC according to Annex I and Annex II)

Type of permit	Installations covered	Permit issued by	Validity period	Legally defined templates	BAT issues	Number of installations
IPPC (according to Annex I =IPPC Directives Annex)	Eu IPPC Directive Annex I type of installations and threshold capacities are taken over.	Regional Environmental Protection Departments (REDPs in 8 regions)	No termination date. Annual review of conditions shall be done by REDPs. If HS are used, termination date is set. Any planned change in activity shall be reported to REDP prior implementing the change. IPPC permits are available in paper format in REDPs. No IPPC database available in the Internet.	Permit application and permit content are defined by regulation of MoE. Both text and predefined tables templates shall be used in application.	Applicant has to compare its activities with relevant EU BREF and other available guidelines. There is a specific table for that. The same table is used in permit. [But it is not so clear what is the extent of comparison, both for applicants and also for REDPs] No national BAT guidelines have been developed	In LT: Chemicals: 5, Energy: 30, Ferrous metals: 1, Minerals: 10, Waste: 37, Oher: 72. (Environemtal Protection Depratment for 2005).

Type of permit	Installations covered	Permit issued by	Validity period	Legally defined templates	BAT issues	Number of installations
PPC permits for installations, which need permit according to Annex II - national obligation (wastewater discharge is included)	Installations discharging: ○ > 5 m3/day of wastewater directly to environment; ○ priority hazardous substances; ○ surface run-off under certain conditions. If wastewater is discharged to municipal sewerage system, there is no wastewater discharge permit for the installation. Overall permit is issued for the company responsible for the operation of the sewerage system	Regional Environmental Protection Departments (REDPs in 8 regions)	No termination date. Annual review of conditions shall be done by REDPs. If HS are used, termination date is set. Permit shall be changed if there are changes in legal requirements or there is evidence of substantial environmental impacts from permitted activity. IPPC permits are available in paper format in REDPs. No IPPC database available in the Internet.	Permit application and permit content are defined by regulation of MoE. Both text and predefined tables templates shall be used in application.	BAT is not required	Around 6000 in Vilnius REPD (one of 8 REDPs).
Discharge to municipal sewerage	Any installation discharging into municipal sewerage system	No permit – contract with operator of the sewerage	As agreed with operator. Contract is not a public document	Hazardous substances discharged by client shall be reported to the operator 9noted in contract)	Not mentioned	No data

Further details on the hazardous substance issue in permits (LITHUANIA)

Type of permit	Information on input materials in applications				Requirements in permits			Guidance available
	Requested	**Segregation according to classification (Juhan's comment:** raw materials not classified as hazardous/dangerous are shown in one table, classified in other**)**	**Hazardous substances in preparations revealed**	**Contaminants considered**	**Assessment of environmental fate of substances**	**Requirements to phase out or substitute**	**Monitoring of pollutants**	
IPPC	YES	YES	NO	YES	YES	General BAT requirement + specific BREFs	If ELV in permit and monitoring condition set	Environmental Protection Agency (www.aaa.am.lt)
Wastewater discharge	YES	YES	NO	YES	YES	NO	If ELV in permit and monitoring condition set	Environmental Protection Agency (www.aaa.am.lt)
Discharge to municipal sewery	NO	-	-	-	(same as above)	(same as above)	If agreement foresees	No.

Does applications/permitting system in principal sufficiently addresses the hazardous substance issue?

Yes, but in reality it does not work well enough. Parameters listed in the permits are usually "traditional" ones as, for example, metals, BOD, COD, total nitrogen, some PAH, VOC etc. While issuing the permit the "new-generation" pollutants (phtalates, organotins, phenols and their ethoxylates, chlorinated parafins, brominated diphenylethers) are not yet considered. The reasons for that could be different, e.g. too low knowledge and experience from both sites – industry and permitting authorities to be able to identify the occurrence of these substances in the raw materials, specify the potentially relevant substances based on the processes applied in the companies, not available analysis methods for checking and control of these substances in the effluents and posing sanctions for the exceeded limits

POLAND

Type of permit	Installations covered	Permit issued by	Validity period and availability	Legally defined templates, guidances	BAT	Number of installations
IPPC	EU IPPC Directive Annex I type of installations and threshold capacities are taken over. No additional activities covered in Poland.	Regional authority (wojewoda – there are 16 of them in the country) or county (powiat – there are 379 of them in the country). Who issues the premit depends on the type and capacity of given installation. This division applies to IPPC permts as well as other environmental permits.	The IPPC Permit can be valid for max. 10 years. In some cases shorter validity periods are applied. After 5 years permits must be reviewed by the issuing authority. This may result in changes, especially if BAT requirements or legal requirements changed. Any change in activity shall be reported to the issuing authority prior implementing the change. The authority may decide it is a significant change, which require change in the IPPC permit. Issued permits are available MoE and issuing authorities. They are not available in the Internet.	Guidelines for IPPC permit application and permit were defined in the Danish project (COWI and Carl Bro) and published by MoE. The guidelines contain the following tables: 1. consumption of raw and auxiliary materials containing dangerous materials 2. semiproducts present in the production processes containing dangerous materials 3. identification data for dangerous substances (name, trade name, CAS number, risk category, R and S phrases. See question above The guidelines are not legally binding ie. the operator may prepare the application in other form under condition it consists all the information required by Environment Protection Act. In practice most of applicants use the guidelines. Environmental Protection Act requires that in the area of wastewater discharge the application and permit should meet the same requirements as indicated in the Water Law Act in relation to discharging wastewaters (see below). That means that only Mercury and Cadmium of the target substances are directly regulated by ELVs. Short and medium chain chlorinated paraffins (SCCP) are indirectly regulated by ELV for AOX.	Applicant has to compare its activities with relevant EU BREF and other available guidelines. There is a specific table for that in the guidelines (not binding). For some types of installations local BAT guidelines have been developed (plywood and fibreboard; oil-shale processing, cattle farms). For existing installations BAT level should be achieved by 30.10.07. Exceptions listed in the accession agreement – about 70 companies given by names.	Approx 1200

Type of permit	Installations covered	Permit issued by	Validity period and availability	Legally defined templates, guidances	BAT	Number of installations
Wastewater discharge to environment	Any installation discharging wastewater and any other pollutants directly into environment (into surface water, sea, soil, ground water) requires so called "water permit". Installations holding IPPC permits covering discharging of wastewater do not need additional water permit but requirements related to water permits are included in IPPC application and permits.	Regional authority (wojewoda – there are 16 of them in the country) or county (powiat – there are 379 of them in the country). Who issues the premit depends on the type and capacity of given installation.	Valid up to 10 years. Every 4 years permits must be reviewed by the issuing authority. This may result in changes or withdrawal of the permit, especially if legal requirements or environmental conditions changed. Permit shall be changed if there are changes in legal requirements or there is evidence of substantial environ-mental impacts from permitted activity. Issued permits and applications are available at the issuing authorities. They are not available in the Internet.	There are no official templates either for the application or permit itself. According to Water Law Act the application shall include: among other: 1. mass balance and description of the materials used, which are important for determining the impact on environment. 2. amounts and composition of the wastewater discharged. 3. max. loads of pollutants, especially those hazardous to aquatic environment (they should be expressed load in relation to the use of materials or volume of production. Practically the applicant need to prove that the concentrations of pollutants in wastewater does not exceed the limits given in the Decree of Minister of Environment of 24/07/2006 on the conditions for discharging wastewater to waters or ground and substances particularly hazardous for aquatic environment.(Dz. U. no. 137. item 984). It addresses directly only Cadmium and Mercury from the target substances. Short and medium chain chlorinated paraffins (SCCP) are indirectly regulated by ELV for AOX. The Water Law Act mention the priority substances in the chapter regarding policy making, but no indication is given in the chapters related to water permits.	Comparison with BAT is not required.	unknown

Type of permit	Installations covered	Permit issued by	Validity period and availability	Legally defined templates, guidances	BAT	Number of installations
Discharge to municipal sewer	In general wastewater discharge to the public sewer does not require permit but contract with the sewer operator. In some cases industrial wastewater discharge to municipal sewer requires water permit as well. It is the case only if the substances listed in the Decree of Minister of Environment of 10/11/2005 on substances particularly hazardous for aquatic environment, which discharged to public sewer require water permit. (Dz. U. Nr 233, poz. 1988). The list contain only Mercury and Cadmium out of the target substances.	Regional authority (wojewoda – there are 16 of them in the country) or county (powiat – there are 379 of them in the country). Who issues the premit depends on the type and capacity of given installation.	Obligation of signing the contract between the sewer operator and the operator of any installation comes form the Act on Common Water Supply and Wastewater discharge. Contract is not a public document. Permits for discharging wastewater to the public sewer are valid max. 4 years.	The conditions of the contract should be set in the way allowing to meet the requirements given in the water permit held by the sewer operator. Contracts address at least the substances listed in the Decree of the Minister of Construction of 14/07/2006 on the way of fulfilling the obligations related to entities discharging industrial wastewater and conditions for discharging wastewater to the public sewer. (Dz. U. No. 136, item. 964). Water permits in case of discharging to the sewer need to meet the same requirements as in other water permits.	Not mentioned	Not counted

Further details on the hazardous substance issue in permits (POLAND)

POLAND

Type of permit	Information on input materials in applications				Requirements in permits			Guidance available
	Requested	Segregation according to classification	Hazardous substances in preparations revealed	Contaminants considered	Assessment of environmental fate of substances	Requirements to phase out or substitute	Monitoring of pollutants	
IPPC	YES	YES[1]	YES[1]	NO	Same as in waste-water discharge	General BAT requirement + specific BREFs	If ELV in permit and monitoring condition set	General (non-binding) guidance for IPPC application and permit published by MoE. For some sectors more detailed BAT guidance available (Steelworks Foundries Dairies Primary smelters Beer making Chemical Non alcoholic beverages Pulp and paper Coke production Ceramic)
Wastewater discharge to environment	YES[2]	NO	YES[2]	NO	Data on amounts and concentrate-ions of emitted pollutants, on hazardous substances discharged into municipal sewer and which can not be treated in treatment plants*	NO	If ELV in permit and monitoring condition set	NO
Discharge to municipal sewery	YES[2]	NO	YES[2]	NO	Same as in waste-water discharge	NO	If ELV in permit and monitoring condition set If agreement foresees.	NO

[1] required by non-binding guidelines not directly by the law
[2] Water Law requires to provide in the application a mass balance and description of the materials used, which are important for determining the impact on environment. No more details given.

Does applications/permitting system in principal sufficiently addresses the hazardous substance issue? IPPC permits in Poland address either the ELV/EQS given directly in the law or BAT issues described unambiguously in BREFs. General statements either in the law or BREFs do not ensure that hazardous substances will be dealt with in great details.

ANNEX A.5:

BAT issues in permits (including case studies)

General background

Best Available Technique (BAT) concept includes from one side technology (hardware) used, from other side how industrial installation is planned, designed, operated, controlled, maintained and decommissioned.

The BAT concept is core element in IPPC permitting – IPPC installation should comply with BAT level defined for each IPPC sector and sub-sectors. EU has developed BAT guidelines – BREFs. It must be stressed that BREFs are guidelines not legal acts, and local circumstances shall be considered in permit issuing process. Practically it means, that BAT for an installation is defined in permitting process (and it is not so easy to evaluate just by brief review of permit if BAT is defined correctly).

Also IPPC Directive foresees possibility for a Member State to apply generally binding rules (GBR) instead of BREFs.

Article 9(8) of the IPPC Directive allows for Member States to use GBRs in place of certain aspects of installation specific permits, as long as the integrated approach is maintained and an equivalent high level of environmental protection is ensured. However, the Directive does not provide a definition of a GBR. Three possible alternatives are in use by Member States:

- A statutory set of standard conditions applying to the entire operation of an installation;
- A statutory set of standard conditions applying to one or more aspects of the operation of an installation;
- A statutory set of minimum conditions established at a national level and binding on regional regulators.

The need for ensuring an equivalent high level of environmental protection means that GBRs cannot be used where there are particular local environmental sensitivities which can only be assessed using individual BAT determinations. Thus GBRs are appropriate where emissions do not lead to local problems or where interactions with individual media are predictable.

GBRs (though not necessarily by that name) are used for various regulatory purposes by a number of Member States. These may take the form of standard emission limits for individual categories of installation or standard conditions for the entire operation of installations. Within the latter category most are used for very small processes which are not included within the IPPC regime, although some, eg in the Netherlands, would apply to IPPC installations.

GBRs have a number of advantages, not least that, once developed, they can simplify permit applications and determinations for the regulator and industry, thus reducing costs. The advantages and disadvantages will vary widely between Member States depending on the nature and structure of the regulators and industrial sectors and the number of IPPC installations of each category.
[Source: The IMPEL Network. The Application of Generally Binding Rules in the Implementation of IPPC Directive]

There are 2 types of installations regarding BAT implementation:

a) new installations – installation shall comply with BAT from „birth"; for this type of companies basis for technology selection are technologies described in BREF (one of the most well defined is for cement factories – dry process with short kilns), but still it is possible to come out with different one if you manage to prove that raw material, water and energy consumption, and emissions to air, water and waste generation are comparable or better than indicated BAT techniques; *hazardous substance problem should be defined in permitting process for new installations as follows [taking into account local circumstances, i.e. location of the company in the Baltic Sea catchment area] – technologies shall be chosen where HELCOM hazardous substances are not used as raw materials nor auxilliaries; operation and contol of the installation shall ensure that no HELCOM hazardous substances are contained in products used in processes [of course, this approach is not applicable for heavy metals in certain processes – then we speak about minimisation / treatment of emissions]*
b) existing installations – installations established before implementation of IPPC legislation in a new member state (national legislation to be checked for specific dates, for old member states there are exact dates in IPPC Directive), these installations shall comply with IPPC Directive requirements by October 30 2007 as latest. From BAT implementation viewpoint these installations have certain flexibility – for illustration Estonian cement factory case: wet technology with long kilns is used (i.e. the installation is not in compliance with cement BREF regarding technology, as a result energy and water consumption figures are also not those described in BREF), but emissions are within limits given in BREF. Company has drastically reduced their air emission load compared to past activities. Conclusion – this is BAT company.
If exisiting installation is assessed not to be BAT one, there is need for action plan which shall be part of the permit. If permitting authority decides that there are no realistic actions to upgrade company to BAT level, there should be no IPPC permit and company should stop IPPC related activities by October 30 2007. Poland has received exemptions for BAT implementation at least for 3 years.

BAT related to target hazardous substances

In table X-1 BAT assessment related to target hazardous substances is given. In general, use restrictions are considered as substitution triggers (implemented in the past). If applicable, country / regional differences are indicated. In column "Target substance" remark on use according to official registers in the Baltic States and Poland is given.

BAT measures related to target hazardous substances

Target substance	Industrial Sector	Measures foreseen at EU level (legislation, BREFs)	Implementation	Further actions
Organotin compounds (TBT, TPhT) No reported use in national registers	Antifouling paints for ships	International Convention on the Control of Harmful Anti-fouling Systems on Ships– use of TBT prohibited. In EU application of TBT prohibited since 01.01.2003. Regulation 782/2003/EC on antifouling paints for ships prohibits entry of active TBT coated ships in EU ports since 1.01.2008. EU BREF on Surface Treatment using Organic Solvents (May 2007) specifies following measures for old paint removal in ship painting (page 585): 120. BAT is to reduce dust particle emissions to air by containing the dust and any abrasive and removed paint particles within the dock or the slipway: - by the use of nets and/or water curtains or similar methods; - limiting paint removal with an abrasive in weather conditions where the wind intensity and direction will increase dust drift; - the use of shroud blasting or vacuum blasting, high pressure water or slurry blasting. 121. BAT is reduce waste water contamination by removing paint residues, leftovers and containers, etc from the dock before flooding.	Screened shipyard permits report that there is no TBT use. Permit conditions specify that there is need for better control measures to avoid particles emissions and contamination of water with paint residues while removing old coatings from ships. Russia: information not available	Similar legal measures to be applied for TPhT Ratification of the convention and taking similar measures in Russia Implementation of control measures in shipyards to ensure that old organotin coatings are removed in dry docks with appropriate emission prevention techniques. [reporting by ships / easy detecting system at site should be established]
	Plastic industry (TBT as impurity in organotin stabilisers)	-	In the Baltic States use as a substance unlikely - no compounding of plastic masterbatches Poland: information on stabilisers	General measures as a voluntary action by compounders of plastic masterbatches: - substitution, if possible;

Target substance	Industrial Sector	Measures foreseen at EU level (legislation, BREFs)	Implementation	Further actions
			used in plastic industry not available Russia: information not available	- control of raw material quality in supply chain
Brominated flame retardants (penta-, octa-, deca BDPE; HBCDD) No reported use in national registries	General	Use of penta- and octa-BDPE is severely restricted in industrial applications in EU since 15.2.2003: 1) they shall not be placed on the market or used as a substance or as a constitu-ent of preparations in concentrations higher than 0,1 % by mass. 2. Articles may not be placed on the market if they, or flame-retarded parts thereof, contain this substance in concentrations higher than 0,1 % by mass.	Environmental permit review / industry interviews did not reveal use of brominated flame retardants in the Baltic States. Poland: information on brominated flame retardants uses is not available Russia: there is fishery EQS assigned for penta-BDPE, which indicates possible legal use: discharge to fishery water bodies prohibited due to tendency to cover bottom. Substance itself is not classified as dangerous. More detailed information on use is not available Comparative study of cable manufactures in Estonia, Lithuania and Russia is presented in	EU-based actions should concentrate on elimination of deca-BDPE. At Member States level, countries such as Sweden and the Netherlands have already taken actions to implement wide-ranging marketing restrictions to Deca-BDPE Russia: recognition of hazardousness of brominated flame retardants and taking legal measures to apply marketing restrictions.
	Textile finishing	EU BREF for the Textiles Industry (July 2003) 1) General measures of chemicals management2) Deca-BDPE: Process design and operation should avoid the discharge of concentrated liquors to waste water, minimise losses to the effluent, and ensure that adsorption to the sludge is effective in the waste water treatment plant. Furthermore, special care should be taken for the disposal of the sludge and solid waste containing halogenated flame retardants [page 504]. 3) General BAT measures for finishing processes to minimise residual liquor by: - using minimal application techniques (e.g. foam application, spraying) or reducing volume of padding devices; - re-using padding liquors if quality is not affected [page 454].		

Target substance	Industrial Sector	Measures foreseen at EU level (legislation, BREFs)	Implementation	Further actions
	Other uses: production of flexible PU foam articles production of electrical equipment, production of plastics: no specific BAT measures . Waste management stage could be important			
Perfluoroalkylated substances (PFAS) especially PFOS No reported use in national registries.	Electroplating of metal surfaces	EU BREF for surface treatment of metals and Plastics August 2006 [page 411]: There are limited options to substitute for PFOS and health and safety may be a particularly important factor. Where PFOS is used, it is BAT to minimise the use by: - monitoring and controlling the additions of materials containing PFOS by measuring surface tension - minimising air emissions by using floating insulation sections - controlling the air emissions of the hazardous fumes. Where PFOS is used, it is BAT to minimise its emission to the environment by material conservation techniques, such as closing the material loop. In anodising plants, it is BAT to use PFOS-free surfactants. In other processes, it is BAT to seek to phase out PFOS. The are limitations to these options discussed in the indicated sections: - using PFOS-free processes: substitutes for alkali cyanide-free zinc electroplating and for hexavalent chromium processes. - enclosing the process or the relevant tank for automatic lines.	Use of potassium salt of perfluoroctasulphonic acid (up to 0,04 tonnes per year, actual use 10-20 kg) was detected by permit review in an electroplating company in Estonia As permit was issued in 2003, there are no specific measures related to PFOS included. AS use of PFOS is to be restricted in EU, company is seeking for alternatives together with supplier to avoid formation of acidic mists from chromating vats.	EU-wide restrictions on PFOS should be imposed by 27.07.2008 by Directive 2006/122/EC. Limit in preparations: 0,005 %. PFOS will be allowed with the mandate to propose further restrictions as safer alternatives become available. (a) photoresists or anti reflective coatings for photolithography processes, (b) photographic coatings applied to films, papers, or printing plates, (c) mist suppressants for non-decorative hard chromium (VI) plating and wetting agents for use in controlled electroplating systems where the amount of PFOS released into the environment is minimised, by fully applying relevant best available techniques (d) hydraulic fluids for aviation.

Target substance	Industrial Sector	Measures foreseen at EU level (legislation, BREFs)	Implementation	Further actions
	Impregnation of textiles (water and oil repellent)	No specific BAT measures foreseen. General BAT measures for finishing processes and chemical management apply (see brominated flame retardants)	Environmental permit review / industry interviews did not reveal other uses of PFOS in the Baltic States. Poland: information on use of PFOS not available Russia: some perfluorinated compounds have EQS and appear in registry of potentially hazardous substances, but no PFOS detected.	Russia: recognition of hazardousness of PFOS and taking legal measures to apply marketing restrictions
	Impregnation of paper (water and oil repellent)	No specific BAT measures foreseen in EU BREF on Pulp and Paper Industry (December 2001).		
	Other uses: cleaning products, waxes and floor polishes, photographic industry, semiconductor industry, fire-fighting foams, fire retardant, corrosion inhibitor: no specific BAT measures			
Nonylphenols and nonylphenol ethoxylates Reported amounts in registries: Poland 12139 tons (2003) Latvia: 0,166 tons (2004) in car care products + 2 tons of polyethylene glycol nonylphenol ethers, CAS 9016-45-9 (2004, 2005) in construction industry	Plastic industry, cosmetics, household cleaners, chemical industry	May not be placed on the market or used as a substance or constituent of preparations in concentrations equal or higher than 0,1 % by mass for the following purposes (since 17.7.2003): (1) industrial and institutional cleaning except: — controlled closed dry cleaning systems where the washing liquid is recycled or incinerated, — cleaning systems with special treatment where the washing liquid is recycled or incinerated; (2) domestic cleaning; (3) textiles and leather processing except: — processing with no release into waste water, — systems with special treatment where the process water is pre-treated to remove the organic fraction completely prior to biological waste water treatment (degreasing of sheepskin); (4) emulsifier in agricultural teat dips;	By permit screen NPE has been detected in chemicals used in leather industry in Estonia (2,0 tons of product) and Latvia (7,0 tons of product), but permits are from 2003, and suppliers of chemicals are from EU Formulators of cleaning chemicals in Estonia reported no use of NPEs also in pre-EU period. HELCOM has reports on use of NPEs especially in Lithuania and Poland, but there were no findings to confirm the reports. In year 2003 in Poland was 68 preparations containing NP and 340 preparations with NPE.	Russia: recognition of hazardousness of NP /NPEs and taking legal measures to apply marketing restrictions

Target substance	Industrial Sector	Measures foreseen at EU level (legislation, BREFs)	Implementation	Further actions
		(5) metal working except: — uses in controlled closed systems where the washing liquid is recycled or incinerated; (6) manufacturing of pulp and paper; (7) cosmetic products; (8) other personal care products except: — spermicides; (9) co-formulants in pesticides and biocides.	Russia: NPEs are available on the market as a mixture of mono- and dialkylphenol ethoxylates C_8…C_{12} (named OP-7). There are at least 3 production sites (not in NW Russia), substance is used as emulsifier, foaming aid, soap in variety of processes.	
	Paint industry	No specific BAT measures	By permit screen and interviews there are 2 confirmed uses of NPE containing materials in paint industry in Estonia	Raising awareness of industrial community to substitute NPEs in paint industry applications
Octylphenols and octylphenol ethoxylates Latvia: octylphenoxypropylethyleneoxyethanol, CAS 9002-93-1 2002-5: a' 2 t/a in glass industry	Chemical industry, production of rubber and plastics, photographic chemicals, industrial cleaning, paints and varnishes: no specific BAT measures		Environmental permit review / industry interviews did not reveal use of OP/OPEs in the Baltic States. Poland: information on use not available Russia: same as NP/NPEs	EU based actions similar to NP/NPEs to be taken. Russia: same as for NP/NPEs
Short chain chlorinated paraffins (C_{10} – C_{13}) No reported use in national registries, except Poland: 59,1 tons (2003)	Metal cutting and working fluids Fat liquoring agent in leather tanning/dressing	Use is severely restricted in industrial applications in EU since 6.7.2002: SCCP may not be placed on the market for use as substances or as constituents of other substances or preparations in concentrations higher than 1 %: — in metalworking; — for fat liquoring of leather.	Environmental permit review / industry interviews did not reveal use of SCCP in the Baltic States. Poland: information on current use not available. In 2003 3 preparations contained SCCP. Russia: chlorinated paraffins are	Russia: recognition of hazardousness of chlorinated paraffins mixtures similar to SCCP and taking legal measures to apply marketing restrictions
	Flame retardant in textile industry	Same BAT measures as for brominated flame retardants		

Target substance	Industrial Sector	Measures foreseen at EU level (legislation, BREFs)	Implementation	Further actions
	Other uses: binder in paints, flame retardant and plasticiser for PVC, sealants: no specific BAT measures		in legal use	
Medium chain chlorinated paraffins (C_{14} – C_{17}) Estonia: 947 tons Latvia: 135 tons Poland: 1081,7 tons	Similar uses as SCCP	No specific BAT measures foreseen. For waste management options see	Estonia: production of construction foams, 5 tons in leather industry. Latvija: production of sealants Poland: information on current use not available.	
Cadmium and its compounds No reported use in national registries.	Cadmium is produced mainly as a byproduct from mining, smelting, and refining sulfide ores of zinc, and to a lesser degree, lead and copper. Global production > 10 000 tons annually. Cd is used in Ni-Cd batteries, pigments, alloys, nuclear industry, etc.	Use is severely restricted in industrial applications in EU since 12.7.1991: 1. Cd shall not be used to give colour to finished articles manufactured from the substances and preparations listed below: a) plastic polymers and resins with the exception of of low-density polyethylene used for the production of coloured masterbatch; b) paints 2. Cd shall not be used to stabilise the finished articles listed below manufactured from polymers or copolymers of vinyl chloride: 3. Cd shall not be used for cadmium plating metallic articles or components of the articles used in the certain sectors / applications. There are certain exemptions foreseen in above mentioned restrictions (safety reasons, certain applications).	Environmental permit review / industry interviews did not reveal use of cadmium in the Baltic States and Poland. Russia: at least 1 producer with supply capacity 150 tons per month.. Cd is used in paint industry, in production of copper wires (1 % Cd is added to copper to improve mechanical properties), Cd coatings … No users detected in NW Russia.	Russia: taking legal measures to apply marketing restrictions similar to EU
Cadmium as pollutant	Iron&Steel industry	EU BREF on Iron&Steel production (December 2001) is not setting specific emission limit values for Cd (review of achie-vable concentrations by different techniques is given).	See case study for iron and steel works in Poland	Additional measures to reduce dust and related heavy metal emissions could be implemented

Target substance	Industrial Sector	Measures foreseen at EU level (legislation, BREFs)	Implementation	Further actions
	Other sectors: large combustion plants, cement industry, foundries	There are specific BREFs for mentioned industrial sectors. Specific emission limit values for Cd are not set. Council Directive 83/513/EEC of 26 September 1983 sets limit values and quality objectives for cadmium discharges for any type of industy handling Cd.	Comparative study in cement industry	-
Mercury and its compounds	Production in EU is around 1100 tonnes per year. Mercury is used in thermometers, barometers and other scientific apparatus. By far the largest use of Hg is the mercury cell process of chlor-alkali production, which is also major source of environmental pollution.	Use of mercury compounds has been banned as pesticide and severely restricted as biocide in EU since 30.12.1989: constituents of preparations intended for use: (a) to prevent the fouling by micro-organisms, plants or animals of: – the hulls of boats, – cages, floats, nets and any other appliances or equipment used for fish or shellfish farming, – any totally or partly submerged appliances or equipment; (b) in the preservation of wood; (c) in the impregnation of heavy-duty industrial textiles and yarn intended for their manufacture; (d) in the treatment of industrial waters, irrespective of their use. Council Directive 82/176/EEC of 22 March 1982 sets limit values and quality objectives for mercury discharges by the chlor-alkali electrolysis industry.	After about 1985, all new chlorine-alkali production facilities use membrane cell or diaphragm cell technologies to produce chlorine. In 2005 EU has adopted Community Strategy Concerning Mercury {SEC(2005) 101} / COM/2005/0020 final /. The strategy therefore has the following objectives: - Reducing mercury emissions . - Reducing the entry into circulation of mercury in society by cutting supply and demand . - Resolving the long-term fate of mercury surpluses and societal reservoirs (in products still in use or in storage). - Protecting against Hg	EU is discussing ban on use of certain measurement devices containing Hg. Further planning of actions based on the Strategy <u>Russia:</u> 1) inventory of actions already taken to reduce Hg use and emissions 2) based on inventory, recommendation of further actions similar to EU
	Mercury as pollutant in other industries	Council Directive 84/156/EEC of 8 March 1984 sets limit values and quality objectives for mercury discharges by sectors other than the		Same as above

Target substance	Industrial Sector	Measures foreseen at EU level (legislation, BREFs)	Implementation	Further actions
		chlor-alkali electrolysis industry (chemical industry using Hg catalysts, vinyl chloride production, manufacture of Hg catalysts and Hg comp-ounds, primary Hg batteries, Hg recovery plants, plants for treatment of Hg containing waste, non-ferrous metal production)	exposure . - Improving understanding of the Hg problem and its solutions. - Supporting and promoting international action on mercury.	
Dioxines	Dioxines are produced in combustion processes under certain conditions	See separate chapter at the end of this annex for measures		

Textile finishing case study

The textile industry is a fragmented and heterogeneous sector, composed of a wide number of sub-sectors. The nature of waste generated depends on the type of textile facility, the processes being operated and the fibres used. Despite this complexity, a number of techniques can be defined as general BAT applicable to all types of textile operations, regardless of the processes they use or the products they produce.

Management
Technology by itself is not sufficient; it needs to go together with environmental management and good housekeeping. Management of an installation that uses potentially polluting processes requires the implementation of many of the elements of an Environmental Management System
(EMS).

BAT is to:

- Implement environmental awareness and include it in training programmes.
- Apply good practices for maintenance and cleaning.
- Store each chemical according to the instructions given by the manufacturer in the Material Safety Data Sheets.
- Put in place measures to avoid spillage of chemicals and process liquors. If spillage does occur, containment procedures must be available as well as a means of cleaning up and disposing of the spillage safely. It should be impossible for spillage to enter surface waters or sewer.
- Implement a monitoring system for process inputs and outputs (both on-site and on-process level), including inputs of textile raw material, chemicals, heat, power and water, and outputs of product, waste water, air emissions, sludges, solid wastes and by-products. A good knowledge of the process inputs and outputs is a prerequisite for identifying priority areas and options for improving environmental performance.

Dosing and dispensing of chemicals (excluding dyes)
BAT is to install automated dosing and dispensing systems which meter the exact amounts of chemicals and auxiliaries required and deliver them directly to the various machines through pipework without human contact. The water used for washing the preparation vessel and supply pipes is taken into account when the quantity of prepared liquor is calculated. Other systems use individual streams for each of the products to be delivered. In this way the chemicals are not premixed before being introduced into the applicator or machine and there is no need to clean containers, pumps and pipes before the next step.

Selection & use of chemicals
BAT is to follow certain general principles in selecting chemicals and managing their use:

- Where it is possible to achieve the desired process result without the use of chemicals, then avoid their use altogether.
- Where this is not possible, adopt a risk-based approach to selecting chemicals and their utilisation mode in order to ensure the lowest overall environmental risk.

There are a number of lists and classification tools for chemicals. Modes of operation that ensure the lowest overall risk include techniques such as closed-loops and the in-loop destruction of pollutants.

Following these principles, a number of detailed BAT conclusions arise.

For surfactants BAT is to substitute alkylphenol ethoxylates and other hazardous surfactants with susbtitutes that are readily biodegradable or bioeliminable in the waste water treatment plant and do not form toxic metabolites.

For complexing agents BAT is to:

- avoid or reduce the use of complexing agent in pre-treatment and dyeing processes by a combination of:
    - Softening of fresh water to remove the iron and the hardening alkaline-earth cations from the process water;
    - Using a dry process to remove coarse iron particles from the fabric before bleaching. This treatment is convenient when the process starts with an oxidative/desizing step. However, this step is not necessary when an alkaline scouring treatment is carried out as a first step before bleaching;
    - Removing the iron that is inside the fibre using acid demineralisation, or better, non-hazardous reductive agents, before bleaching heavily contaminated fabrics;
    - Applying hydrogen peroxide under optimal controlled conditions;
    - Select biodegradable or bioeliminable complexing agents.

For antifoaming agents BAT is to:

- minimise or avoid their use by:
    - Using bath-less air-jets, where the liquor is not agitated by fabric rotation;
    - Re-using treated bath;
    - Select anti-foaming agents that are free from mineral oils and that are characterised by high bioelimination rates.

Selection of incoming fibre raw material

At present, textile manufacturers are not well informed by their suppliers about the quality and quantity of substances (e.g. preparation agents, pesticides, knitting oils) applied on the fibre during the upstream processes. Knowledge of these characteristics is essential to enable the manufacturer to prevent and control the environmental impact resulting from these substances.

BAT is to seek collaboration with upstream partners in the textile chain in order to create a chain of environmental responsibility for textiles. It is desirable to exchange information on the type and load of chemicals that are added and remain on the fibre at each stage of the product's life cycle. Besides specific contract conditions, a number of schemes exist such as the organic certification for cotton, the certification scheme applied in Germany for garments, etc.

In table X-2 are summarised findings for selected Baltic states textile companies.

In general, problem is to identify substances behind the trade-names of finishing chemicals in permit documentation, and often specified substances do not have CAS numbers provided.

Also BAT assessment considering technological processes in detail is not performed at full extent according to EU BREF chapter (e.g. to assess material consumption of materials in finishing processes), but at the same time all the installations reviewed are existing ones, and BREFs are giving choice of options, not defining the technique to be used, which makes such comparisons irrelevant as no BAT associated consumption levels are not given.

Information on selected textile finishing companies

Description / BAT measure	Implementation		
	Estonia	**Latvia**	**Lithuania**
General profile of production process	Spinning, weaving, dyeing, finishing (total capacity 4,6 million meters of textile per month, finishing: > 10 tonnes per day)	275 tonnes of textiles are treated per month. Types of yarns: synthetic threads, polyamide, polyester, cotton, wool mixture, rayon. Processes: washing, dyeing. Not an IPPC-installation.	Spinning (150 tonnes of yarns per month); dyeing (20 tonnes per month); weaving (600'000 meters per month); finishing (bleaching, dyeing, printing, softening, special treatment – waterproofing, grease and dirt repelling). Yarn type: linen
General management issues			
Training of employees	Annual training plan of employees is part of management system	NA	Employees are trained on various topics periodically, in compliance with legal acts. Professional trainings and retrain take place each 5 years.
Monitoring of inputs and outputs	Monitoring of inputs and outputs is performed. Monitoring plan is part of the permit	NA	Monitoring of inputs and outputs is performed. Monitoring plan is part of the permit
Certification of management system	ISO 9001: 2000 (weaving, finishing) ISO 14001:2004 (finishing) WRAP Ökotex-100	NA	ISO 9001:2000. First certified in 2003, current certification valid until 2009
Automated dosing and dispensing of chemicals	Dosing and dispensing of chemicals is automated	NA	Automated chemicals dosing systems exist in bleaching and dyeing
Selection and use of chemicals			
Selection of chemicals: risk assessments? information requested / stored?	Criteria for selection of chemicals: - safety data sheets available; - finishing chemicals shall comply with Eco Tex – 100 requirements	Chemicals are selected according to production needs, information about chemicals – available safety data sheets, chemicals inventory. Used chemicals :dispersion of alcohols, alcohol ethers.	Chemical substances are selected according to their hazards (less hazardous are selected) and eco100 standard principles, quality, clients' requests, physicochemical parameters. Other requirements: less polluting ones Information on chemicals: SDS,

Description / BAT measure	Implementation		
	Estonia	Latvia	Lithuania
			chemical substances accounting (received, used in departments, in storages, etc.), chemical substances register is possessed in electronic form
Types of surfactants used in production processes	Variety, but no APEOS.	NA	For equipment cleaning in spinning process iodine and isopropyl spirit mixture is used, which does not contain APEOS. Cleaners, Lavaquick (AIRO1000), citric acid, periwet, depicol etc. are used for equipment cleaning in finishing process. Water is used in dying process.
Types of flame retardants used in finishing	Not specified, but no halogenated flame retardants are listed in inventory	NA	Flame retardants are not used in manufacturing processes
Types of water and dirt repellents used in finishing	Not specified	NA	No chemicals are used
Types of emulsifiers used	Variety	NA	Spirafil N, Securon 28, Felosan
Finishing techniques in use	Not specified in sufficient details	NA	In order to reduce pick-up, kiss-roll technique is used

Cable coating case study

Interviews of cable producers were performed in NW Russia (St. Petersburg), Lithuania and Estonia to get information on flame retardants used in cable coatings. In Estonia and Lithuania total number of cable coating companies is 1, for NW Russia there is no data on total number, 1 company was interviewed.

Results of interviews and brief conclusions of BAT implementation are presented below. As there is no relevant EU BREF document, for BAT defining regarding halogenated flame retardants was chosen example of a Norwegian company - extract from their environmental report is presented (source http://www.draka.no).

Information on cable coating companies

Issue	Estonia	Lithuania	NW Russia
1. Certification of management systems	ISO 9001:2000, initial certification in 1998. ISO 14001 certification since 2001. Annual environmental report is available.	ISO 9001:2000, initial certification in 1997. ISO 14001 certification.	Company is ISO 14001 certified in 2007, ISO 9001 in 1996.
2. Main activities	Production on PVC and PEX coated cables	Production of PVC coated cables, polyester enamelled cables	Production of PVC, XLPE, silicon and rubber coated cables.
Production of fireproof cables	No	Yes	Yes
Plastic master batches compounded at site	No	No	No
3. Communication with suppliers on composit-ion of master batches	There is communication with suppliers on com-position of master batches	Company has received the information about stabilisers, plastifiers, flame retardants used for compounding of master batches.	There is communication with suppliers on com-position of master batches and substances emitted during process-ing, but full composition is not revealed by suppliers, as fireproof cables are exempted to be subject of hygiene certification
4. Target hazardous substances existing in inventory of chemicals	No	No	No
5. Other remarks	-	Fireproof properties are not controlled on site	Company is changing to western technology. It means also using west-ern master batches as producer of technology defines raw material to be used.

In general, companies management systems are corresponding to BAT.

It could be recommended that companies introduce annual environmental reporting system on types and quantities of substances used with master batches similar to provided example.

Draka Comteq Draka Norsk Kabel AS

The manufacturing of cables utilises mostly traditional cabling techniques such as wire drawing, extrusion of polymers and rubber, pair twisting, stranding and laying up of cable cores, braiding and armouring.

Raw materials, i.e. mainly copper, aluminium, plastics, and rubber, are purchased from external suppliers. Most of the PVC used is compounded in-house at the plant.

Manufacturing of cables implies consumption of natural resources, emissions, waste and noise, and risks connected to the work environment.

Aspects related to the products were downgraded from high to mean in 2003 after elimination of several hazardous substances from the products such as lead, chloroparaffin, and DEHP softener in PVC. The following aspects are now considered to be the most significant:

• Use of raw materials
• Waste handling

LCA (Life Cycle Assessment) studies have shown that the dominating global environmental impact from cables comes from retrieval and processing of the raw materials used, metals in particular. The impacts of the cable manufacturing process are small in comparison. Effective use of raw materials, reduced scrap levels, and recycling of metal scrap are therefore important mitigation measures we can take to reduce the environ-mental impacts of our products on a global scale.

Consumption of raw materials
The factories consume large amounts of copper, aluminium, PVC, polyethylene and other plastic materials. In addition the Drammen factory uses rubber and some steel for armouring of cables. The factory at Årnes has its own copper conductor drawing facility with an electrolytic tinning process. 27% of the copper volume in 2004 was tinned copper wire. The copper drawing facility at Årnes also supplies copper conductors to the factory in Drammen.
The table below shows consumption of raw materials over the past four years.

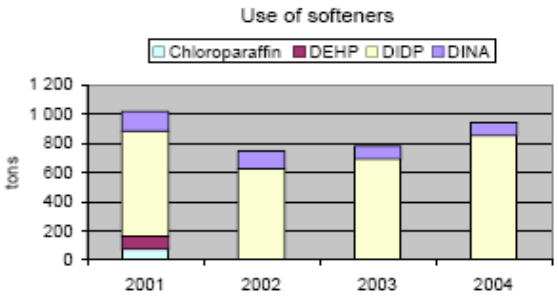
Materials (tons)	2001	2002	2003	2004
Copper	8.260	7.430	7.510	8.010
Aluminium	3.740	3.240	2.450	2.550
Steel	200	230	440	420
PVC	4.310	3.030	2.990	3.620
Polyethylene	2.180	1.760	1.760	1.800
HFFR compounds	1.590	1.300	1.310	1.540
Rubber	1.250	1.720	1.670	1.730
Other materials	1.000	700	350	410

HFFR = Halogen-free flame retardant.
Other materials = various thermoplastic materials, tapes, yarns, jellies, optical fibres and FRP (fibre reinforced plastic).

1.330 tons of the manufactured PVC volume was sold externally in 2004.

Use of lead
Lead in form of organic and inorganic compounds has been used as stabilisers in PVC and rubber, and as lead chromate in some colour pigments. 2004 is our first year with 100% lead-free PVC. Previously we used ca. 60 tons of lead stabilisers annually.

Use of phthalates and other softeners
Phthalates are used as softeners in PVC, and they are essential in order to make PVC suitable as cable material. Some phthalates such as DEHP have been suspected of having hormone-mimicking effects, and therefore classified as harmful to male reproduction and the environment even though this has not been finally verified. The flame retardant softener chloroparaffin is regarded as bioaccumulating and harmful to the environment. We have therefore eliminated all use of both DEHP and chloroparaffin in our cables.



In 2004 we used 942 tons of softeners in PVC, which is up 21% from 2003. Of this 852 tons was DIDP (di-iso-decyl-phthalate) and 90 tons DINA (di-iso-nonyl-adipate). Neither DIDP nor DINA are considered harmful to health and environment.
DNK has developed halogen-free alternatives to several PVC cable types, and about 40% of the total cable volume is now halogen-free.

Emissions to air (2001 report)

(…)

An important product line for DNK are fire resistant and flame retardant cables. Development and quality control of these products require fire testing. Between 500 and 900 kg of cable material are burnt annually (500 kg in 2001), primarily using propane burners. Emissions of CO_2 from fire testing constitutes <1% of the total CO_2 emissions. In addition some HCl is emitted when burning PVC cables (ca. 20 kg in 2001), as well as soot and other combustion products from various plastic and rubber materials. The concentrations emitted during fire testing have been checked against requirements.

(…)

Emissions to water

Cooling water and steam used in some manufacturing processes may contain very small amounts of heavy metals (copper, tin and lead), inorganic salts and traces of organic components. Contamination of the spill water has been measured several times and found to be very small and well below the limits set by SFT. Small amounts of methanol are emitted to water in the hot water XLPE cross-linking baths in Drammen. These emissions are also well below the 3000 mg/l limit set by SFT. Most of the methanol is emitted to air.

Other emissions to water such as wire-drawing emulsions, oils, cleaning solvents, and waste from the tinning process at Årnes, are effectively restricted by use of closed loops and pollution control systems. Residues from the filtering systems are handled as special waste. There were no reports on uncontrolled emissions to water in 2001.

Waste management of products containing halogenated flame retardants or plasti-fiers.

Both for brominated flame retardants and chlorinated paraffins waste management stage could generate substantial environmental load.

Penta-, octa- and decaBDPE are flame retardants of the additive type, i.e. they are physically combined with the material being treated rather than chemically combined (reactive type) flame retardant. Typically, the flame retardants are added at concentrations of 5-30% w/w (i.e. 1 kg polymer contain 5-300 g flame retardant. Once an article has reached the end of its service life, it can be recycled, incinerated or dumped to landfills. In most countries large quantities of PBDE occur in plastic parts in electronic equipment. There are various modes of disposal. In the case of goods are handled by burning in incineration plants, there may be a risk of the formation of halogenated dioxins (e.g. in case of penta- and octaBDPE). There are insufficient monitoring or other testing data on leachability of pentaBDPE from foams in order to assess the magnitude of resulting emissions and discharges to environment, but based on physico-chemical properties of the substance (low water solubility, high octanol-water partition coefficient) it is considered very unlikely that significant amounts of pentaBDPE will leach from landfills as the substance would be expected to adsorb strongly onto soils.

MCCP content of PVC plastic product is estimated to be 6-15% by weight of the PVC. The higher medium-chain chlorinated paraffin contents of 15% by weight of the PVC are usually found in extrusion compounds, with lower levels in PVC for coating processes. HELCOM draft report by Jukka Mehtonen (2007) gives following estimated losses for MCCPs from polymeric materials:

Use	Release factor to air	Release factor to water
PVC	0.05% over lifetimea	0.05% over lifetimea
Paints	0.4%/year over a 7 year lifetimeb	0.15%/year over 5-7 year lifetime
Sealants	0.05% over lifetimea	0.15%/year over 10-30 year lifetime
Rubber/polymers	0.05% over lifetimea	-

Since MCCPs are not generally reacted or changed during their lifecycle, ultimately the majority of MCCPs used in products will be disposed of at the end of the products' useful life. Such waste could include erosion/particulate losses of polymeric products, paints and sealants. Disposal by landfill or incineration is likely to be the ultimate destination of much of the chlorinated paraffin. For some applications, e.g. metal working fluids, some of the chlorinated paraffin could be destroyed in processes such as recycling of metal swarf. For other processes e.g. recycling of carbonless copy paper, most of the MCCPs present is likely to end up in the sludge produced in the process, which will again most likely be disposed of by incineration or landfill.

The vast majority of MCCPs is likely to be present in PVC articles, as this is the main use of MCCPs. Of the possible disposal methods, incineration is likely to completely destroy the MCCPs. In landfills, chlorinated paraffins may be expected to be relatively stable for many years and so could be subject to leaching or volatilisation.

As an example of EU efforts on waste management to further avoid emissions of halogenated substances o environment, requirements for waste electrical and electronic equipment (WEEE) are briefly reviewed as set by Directive 2002/96 EC of 27.01.2003:

The purpose of this Directive is, as a first priority, the prevention of WEEE, and in addition, the reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste. It also seeks to improve the environmental performance of all operators involved in the life cycle of electrical and electronic equipment, e.g. producers, distributors and consumers and

in particular those operators directly involved in the treatment of waste electrical and electronic equipment.

Article 4 Product design
Member States shall encourage the design and production of electrical and electronic equipment which take into account and facilitate dismantling and recovery, in particular the reuse and recycling of WEEE, their components and materials. In this context, Member States shall take appropriate measures so that producers do not prevent, through specific design features or manufacturing processes, WEEE from being reused, unless such specific design features or manufacturing processes present overriding advantages, for example, with regard to the protection of the environment and/or safety requirements.

Article 11 Information for treatment facilities
1. In order to facilitate the reuse and the correct and environmentally sound treatment of WEEE, including maintenance, upgrade, refurbishment and recycling, Member States shall take the necessary measures to ensure that producers provide reuse and treatment information for each type of new EEE put on the market within one year after the equipment is put on the market. This information shall identify, as far as it is needed by reuse centres, treatment and recycling facilities in order to comply with the provisions of this Directive, the different EEE components and materials, as well as the location of dangerous substances and preparations in EEE. It shall be made available to reuse centres, treatment and recycling facilities by producers of EEE in the form of manuals or by means of electronic media (e.g. CD-ROM, online services).
2. Member States shall ensure that any producer of an electrical or electronic appliance put on the market after 13 August 2005 is clearly identifiable by a mark on the appliance. Furthermore, in order to enable the date upon which the appliance was put on the market to be determined unequivocally, a mark on the appliance shall specify that the latter was put on the market after 13 August 2005 The Commission shall promote the preparation of European standards for this purpose.

Although there is no specific BAT measures foreseen for WEEE treatment, following could be considered as BAT (based on experience on EIA of WEEE installation in Estonia in 2006):

- Communication with producers to ensure appropriate information on hazardous substances used in plastics, etc. of EEE;
- Dry processes with fabric filtering of air emissions should be favoured over processes with semi-wet or wet options to control dust emissions;
- Control of input material for presence of hazardous substances in case of suspicion (e.g. Cd in luminoforic powder of older TV-sets)
- Communication with users of secondary materials on composition / quality of output materials to ensure maximum recylability (for the plant EIA was performed, less than 2 % of the input needed disposal as hazardous or non-hazardous solid waste).

Iron & Steel case study

Cadmium
In 1990 iron&steel sector was responsible for 19 % of Cd air emissions in EU. Major source of Cd is considering sintering plants, also electric arc furnaces and basic oxygen furnaces have Cd emissions. Poland has 5,0 % of EU-25 steel production. Only iron&steel producer in the Baltic States is in Latvija (production 0,28 % of EU-25). NW Russia: Kola peninsula region is the 2nd largest steel production region in Russia, some steel mills are also located in St Petersburg.

EU BREF on Iron&Steel production (December 2001) foresees following BAT measures for sintering plants, which are relevant for reduction of cadmium emissions:

1. Waste gas de-dusting by application of:
   - advanced electrostatic precipitation (ESP) (moving electrode ESP, ESP pulse system, high voltage operation of ESP …) *or*
   - electrostatic precipitation plus fabric filter *or*
   - pre-dedusting (e.g. ESP or cyclones) plus high pressure wet scrubbing system.

Using these techniques dust emission concentrations < 50 mg/Nm3 are achieved in normal operation. In case of application of a fabric filter, emissions of 10-20 mg/Nm3 are achieved.

4. Minimisation of heavy metal emissions:
   - Use of fine wet scrubbing systems in order to remove water-soluble heavy metal chlorides, especially lead chloride(s) with an efficiency of > 90% or a bag filter with lime addition;
   - Exclusion of dust from last ESP field from recycling to the sinter strand, dumping it on a secure landfill (watertight sealing, collection and treatment of leachate), possibly after water extraction with subsequent precipitation of heavy metals in order to minimise the quantity to dump.

10. Emissions to water (not cooling water):
These are only relevant when rinsing water is used or when wet waste gas treatment system is employed. In these cases, the effluent water to the receiving environment should be treated by heavy metal precipitation, neutralisation and sand filtration. TOC concentrations < 20 mg C/l and heavy metal concentrations < 0.1 mg/l (Cd, Cr, Cu, Hg, Ni, Pb, Zn) are achieved.

When the receiving water is fresh, attention has to be paid to salt content.

Following emissions of Cd have been reported in BREF from sintering plants after following treatment options:
   - electrostatic filter: 0,076 mg/Nm^3
   - fabric filter: 0,001 mg/Nm^3
   - fine wet scrubber: 0,003 mg/Nm^3, removal efficiency 92 %

<u>Polish case study</u>
Cd releases to air in 2005 originated in 68% from non-industrial combustion and in 22% from industrial combustion.

According to EU EPER registry, 75 % of air emission (1,32 tonnes annually; sector: iron&steel) and 90 % of discharges to water (1,35 tonnes; sector: lead, tin and zinc production) of major industrial installations are originating from a single company.

For the case study iron&steel company was selected. This company has following main production units:

1. 3 sintering strands equipped with ESPs.
2. Smelting installations: 3 iron blast furnaces equipped with ESPs and wet scrubbers for cleaning basic oxygen furnace (BOF) gas to be recovered.
3. Secondary fusion installations: 3 electric arc furnaces equipped with fabric filters and gas recovery with wet treatment.
4. Hot rolling installation (equipped with ESP)
5. Lime production – 3 kilns of 400 Mg/24 hrs capacity (equipped with fabric filters).

Emission data from sintering units

Source	Pollutant	Emission data		
		Max emission	Average emission	Allowed emission
		kg/h	kg/h	kg/h
3	4	5	6	7
Mills and dosing 1	Dust	3,46	2,72	7,0
	Cd	0,00014	0,00011	-
Mills and dosing 2	Dust	0,15	0,11	1,0
	Cd	0,00001	0,000008	-
Mills and dosing 3	Dust	0,024	0,013	1,0
	Cd	0,00001	0,000004	-
Sintering strand 1	dust	86,89	78,15	130,0
	Cd	0,074	0,054	-
Sintering strand 2	dust	169,66	152,80	260,0
	Cd	0,088	0,059	-
Sintering strand 3	dust	86,53	82,51	130,0
	Cd	0,056	0,049	-
Unloading and cooling 1	dust	4,19	3,89	24,0
	Cd	0,0004	0,00021	-
Unloading and cooling 2	dust	11,42	8,19	24,0
	Cd	0,00050	0,00030	-
Unloading and cooling 3	dust	10,85	8,62	24,0
	Cd	0,00044	0,00023	-
Sorting	Dust	3,85	2,40	5,0
	Cd	0,00013	0,000085	-

Pollutant concentrations in waste water after treatment

Pollutant	unit	Average concentration	Treatment efficiency %
COD	mg/O_2/l	22,6	32,1
Chlorides	mg/l	479,0	3,6
Sulphates	mg/l	167,0	0,1
Cyanides	mg/l	0,056	21,1
Susp. solids	mg/l	10,6	88,0
Phenols	mg/l	0,007	80,6
Oils	mg/l	2,7	37,2
Fe	mg/l	0,7	89,4
Zn	mg/l	0,180	73,5
Pb	mg/l	0,047	89,9
Cd	mg/l	0,004	33,3
Cu	mg/l	0,012	29,4
Cr	mg/l	0,004	33,3
As	mg/l	0,0026	13,3
Hg	mg/l	0,0005	9,1

BAT comparison of sintering plant in a Polish Iron&Steel production company

BAT/BREF	
1. Waste gas de-dusting by application of: - Advanced electrostatic precipitation (ESP) (moving electrode ESP, ESP pulse system, high voltage operation of ESP …) or - electrostatic precipitation plus fabric filter or - pre-dedusting (e.g. ESP or cyclones) plus high pressure wet scrubbing system. Using these techniques dust emission concentrations < 50 mg/Nm3 are achieved in normal operation. In case of application of a fabric filter, emissions of 10-20 mg/Nm3 are achieved.	In the preparation of raw materials phase foam scrubbers of 99% efficiency are used . Concentrations of 50 mg/Nm3 are achieved. ESP of 93,5% efficiency are used for sintering strands de-dusting. Concentrations of 100 mg/Nm3 are achieved. Sorting and crushing of sinters are equipped with ESP of 97,8% efficiency. Concentrations of 10 mg/Nm3 are achieved.
2. Waste gas recirculation, if sinter quality and productivity are not significantly affected, by applying: - recirculation of part of the waste gas from the entire surface of the sinter strand, or - sectional waste gas recirculation	Waste gas recirculation is used for energy saving purposes.
3. Minimising of PCDD/F emissions, by means of: - Application of waste gas recirculation; - Treatment of waste gas from sinter strand;	Minimizing dioxins emission is not considered to be the important issue. Waste gas recirculation is used but for energy saving purposes.
- use of fine wet scrubbing systems, values < 0.4 ng I-TEQ/Nm3 have been achieved.	As above
- fabric filtration with addition of lignite coke powder also achieves low PCDD/F emissions (> 98 % reduction, 0.1 – 0.5 ng I-TEQ/Nm3. – this range is based on a 6 hours random sample and steady state conditions).	Fabric filtration not used in the sintering installation.
4. Minimisation of heavy metal emissions - Use of fine wet scrubbing systems in order to remove water-soluble heavy metal chlorides, especially lead chloride(s) with an efficiency of > 90% or a bag filter with lime addition;	Foam scrubbers of 99% efficiency are used.
- Exclusion of dust from last ESP field from recycling to the sinter strand, dumping it on a secure landfill (watertight sealing, collection and treatment of leachate), possibly after water extraction with subsequent precipitation of heavy metals in order to minimise the quantity to dump.	Not identified. Dust is either recycled on-site or given to outside company for recycling.

Dioxines

In Table X-6 are listed BAT measures also for dioxin reduction from sintering units. In addition, efficient detoxification of dioxins contaminated fly ash and metal dust as seen as a priority measure to control dioxins emissions from iron&steel industry.

More detailed measures for dioxin emission reduction possibilities in iron&steel industry are given below (assessment of pilot factory is not possible without detailed knowledge of applied processes):

Dioxins are relevant for thermal processes which have metals present. Dioxins or their precursors may be present in some raw materials and there is a possibility of *de-novo* synthesis in furnaces or abatement systems. Dioxins are easily adsorbed onto solid matter and may be collected by all environmental media as dust, scrubber solids and filter dust. Field tests have shown that the formation of dioxins in cupola furnaces cannot be correlated to one (or a few single) operational parameter(s). A combination of measures is needed to minimise the risk of dioxin formation.

In-process or primary measures to prevent dioxin emissions include:
- post combustion of the furnace off-gas in the CBC shaft or in a HBC combustion chamber.
- combustion of cupola off-gas;
- continuous temperature monitoring and control in the HBC combustion chamber (T >850 ºC) and maximising of the residence time (preferably >2s)
- maintaining the particulate matter concentration in the recuperator at a level <20 mg/m³, this is possible for HBC when using wet dedusting
- providing quick quenching of the dust laden off-gases, through the *de-novo* synthesis temperature range of 250 – 450 ºC
- preventing or minimising the build-up of dust along the cooling trajectory of the flue-gas, especially in the heat-exchanger, e.g. using vertical exchanger tubes, efficient internal cleaning, high temperature de-dusting;
- melting clean scrap;
-

using oxygen injection to ensure complete combustion.

Although dioxins are destroyed at high temperature (i.e. above 850 ºC) in the presence of oxygen, the process of *de-novo* synthesis is still possible as the gases are cooled through the reformation window (250 – 450 ºC). This window can be present in heat-exchangers or abatement systems and in cooler parts of the furnace, e.g. the feed area. Care must be taken in the design of cooling systems to minimise the residence time in the window and to avoid dust build-up, in order to prevent *de-novo* synthesis. An alternative is to dedust the off-gas by quick quenching using a wet system. Sufficient oxygen also needs to be present in the hot gases and for this oxygen injection can be used to ensure complete combustion. Nevertheless, excess oxygen should be prevented since this may support *de-novo* synthesis.

Sulphur has an inhibiting effect on the formation of dioxins, through depletion of molecular chlorine. The use of coal with a higher sulphur content in large combustion plants has been shown to provide lower PCDD/F concentrations. The reducing inhibiting effect is related to the S/Cl ratio, with a critical ratio of 0.64. A further increase does not result in less dioxins and furans. This effect has not been demonstrated in foundries, but may be studied.

The great spreading and big variability in the dioxin emission levels (even for the same installation) show that primary measures alone may not allow a stable and low dioxin emission value. Therefore, besides primary measures, the following abatement measures may be considered:
- *injection of additive powders* into the gas stream, such as activated carbon, open-hearth furnace coke or zeolite, so that dioxins are absorbed onto the surface. High efficiency dust filtration is then used to remove the dust and dioxins. The additive is injected into the offgas stream before filtration. The adsorption process mainly takes place while the absorbents adhere to the filter bag. The filter dust may be recirculated back to the flue-gas to attain a higher efficiency. When using a carbon-based additive, special measures should be taken to prevent fire and explosion risk. The collected dusts may have high dioxin concentrations and will need to be disposed of or treated carefully
- *catalytic oxidation* systems are available for the destruction of dioxins. Fabric filters that incorporate a catalytic layer are used for the destruction of dioxins. In other sectors (e.g. steel, municipal waste incineration) this technique has been implemented successfully and implementation in the foundry industry is considered feasible. However, in order to prevent deactivation of the catalyst layer, a prior removal of coarse dust particles may be needed.

These are techniques to be considered depending on the application. They can all be incorporated into existing processes. The choice of the most effective and economically viable technique will depend on the specific site, safety aspects, and operational stability, as well as on economic factors.

Although the absence of one of the five dioxin building conditions mentioned above hinders dioxin synthesis, it is currently not possible to precisely foresee dioxin emissions by considering known operational parameters. The building of a new furnace therefore needs the careful consideration of primary measures as well as the option to add secondary measures in case of unexpectedly high values.

In-process measurements of dioxins in a hot blast cupola with dry dedusting have shown that high PCDD/F-levels (5 ngTEQ/Nm³) occur in the heat-exchanger. Other parts of the flue-gas system show much lower values. Reduction measures should therefore aim at minimising the contact between dust and flue-gas in this zone, by minimsing dust or reducing the dust residence time.

A PCDD/F-emission level of 0.5 ng TEQ/Nm3 can be achieved by using primary measures; and better than 0.5 ng TEQ/Nm³ can be achieved by using one or more of these techniques. A German survey concluded that without secondary measures the level of 0.1 ng TEQ/Nm³ is passed only in a limited number of installations and then only by a limited extent. The operational data as given in 3.8.2, however show that the level should be evaluated on a plantby-plant basis.

Secondary measures in other sectors have been proven to allow a reduction to below 0.1 ng TEQ/Nm³.

Conclusions

Dust emissions exceed 2 times recommended BAT level, which may give rise also to elevated heavy metal emissions (those contained on dust particles).

No attention is paid to dioxins monitoring and dioxins are not considered at all in existing environmental permit.

It seems that introduction of appropriate fabric filtration systems in addition to existing control measures will reduce emissions 2-fold.

There is need for dioxins monitoring programme and setting appropriate limit values for dioxins.

Cement kilns case study

According to EU BREF on Cement and lime production (2001), the emissions from cement plants which cause greatest concern are nitrogen oxides (NO_x), sulphur dioxide (SO_2) and dust. Other emissions to be considered are carbon oxides (CO, CO_2), volatile organic compounds (VOCs), polychlorinated dibenzodioxins (PCDDs) and dibenzofurans (PCDFs), metals, and noise. Emissions ranges of pollutants are given in Table X-7.

EPER data refer notable dioxin emissions from Polish 6 cement factories, at the same time Estonian, Latvian and Lithuanian cement plants do not have emissions exceeding EPER reporting thresholds. Undertaken brief study did not enable to reveal any differences, therefore BAT considerations of reduction of dioxins and heavy metals are given.

Emission ranges from European cement kilns.
(Table 1.8 from EU BREF document)

Emission ranges from European cement kilns

	mg/Nm³	kg/tonne clinker	tonnes/year
NO_x (as NO_2)	<200–3000	<0.4-6	400-6000
SO_2	<10–3500	<0.02-7	<20-7000
Dust	5–200	0.01-0.4	10-400
CO	500–2000	1-4	1000-4000
CO_2	400-520 g/Nm³	800-1040	0.8-1.04 million
TOC	5-500	0.01–1	10-1000
HF	<0.4-5	<0.8-10 g/t	<0.8-10
HCl	<1-25	<2-50 g/t	<2-50
PCDD/F	<0.1-0.5 ng/Nm³	<200-1000 ng/t	<0.2-1 g/year
Metals:			
Σ (Hg, Cd, Tl)	0.01-0.3 (mainly Hg)	20-600 mg/t	20-600 kg/year
Σ (As, Co, Ni, Se, Te)	0.001-0.1	2-200 mg/t	2-200 kg/year
Σ (Sb, Pb, Cr, Cu, Mn, V, Sn, Zn)	0.005-0.3	10-600 mg/t	10-600 kg/year

Note: Mass figures are based on 2000 m³/tonne clinker and 1 million tonnes clinker/year. Emission ranges are one-year averages and are indicative values based on various measurement techniques. O_2-content is normally 10%.

Table 1.8: Emission ranges data from European cement kilns
Based on [Cembureau report, 1997], [Cembureau], [Dutch report, 1997], [Haug], [Lohse]

Heavy metals

Raw materials and fuels will always contain metals. The concentrations vary widely from one location to another. Metal compounds can be categorised into three classes, based on the volatilities of the metals and their salts:

1. Metals which are or have compounds that are refractory or non-volatile: Ba, Be, Cr, As, Ni, V, Al, Ti, Ca, Fe, Mn, Cu and Ag;
2. Metals that are or have compounds that are semi-volatile: Sb, Cd, Pb, Se, Zn, K and Na;
3. Metals that are or have compounds that are volatile: Hg and Tl.

The behaviour of these metals in the burning process is dependent on their volatility. Non-volatile metal compounds remain within the process and exit the kiln as part of the cement clinker composition. Semi-volatile metal compounds are partly taken into the gas phase at sintering temperatures to condense on the raw material in cooler parts of the kiln system. This leads to a cyclic effect within the kiln system (internal cycles) which builds up to the point where an equilibrium is established and maintained between input and output via the cement clinker.

Volatile metal compounds condense on raw material particles at lower temperatures and potentially form internal or external cycles, if not emitted with the flue gas of the kiln. Thallium and mercury and their compounds are particularly easily volatilised and to a lesser extent so are cadmium, lead, selenium and their compounds. An internal cycle of easily volatile metal compounds is formed, when they react with the calcination feedstock or when they precipitate on the feedstock in cool areas of the calcinations chamber, in the preheater, or in subsequent drying plants. Metals form an external cycle when the dust together with the condensed volatile compounds is separated in dust separators and returned to the raw meal.

The dusts from the production of cement contain small amounts of compounds of metals such as arsenic (As), cadmium (Cd), mercury (Hg), lead (Pb), thallium (Tl) and zinc (Zn). The main source of metal-laden dusts is the kiln system, including preheaters, precalciners, rotary kilns and clinker coolers. The metal concentration depends on the feedstock and recirculation in the kiln system. In particular, the use of coal and waste fuels may increase the input of metals into the process. As the metals entering the kiln system are of varying volatility and because of the high temperature, the hot gases in the cement kiln system contain also gaseous metal compounds. Balance investigations show that there is low retention of elements with high volatility in the clinker, resulting in an accumulation of these substances in the kiln system.

BAT measures to avoid metal It should be avoided to feed materials with high content of volatile metals into the kiln system. Accumulation of metals, especially thallium, in the internal and external cycles of a cement kiln system results in an increase in emissions with increasing kiln operating time. This can be reduced by partly or completely interrupting these cycles. However, the close interconnection between internal and external cycles means it is sufficient to interrupt only the external cycle.

This can be done by discarding the dust collected in the dust collector, instead of returning it to the raw meal. When its chemical composition is suitable, this discarded cement kiln dust can be added directly to the cement milling stage. Karlsruhe II, 1996. As the emitted metals (except part of the mercury) are to a large extent bound to dust, abatement strategies for metals are covered by abatement strategies for dust. One way to minimise mercury emissions is to lower the exhaust temperature. Non-volatile elements remain within the process and exit the kiln as part of the cement clinker composition. When high concentrations of volatile metals (especially mercury) occur, absorption on activated carbon is an option.

PCDD/F

Any chlorine input in the presence of organic material may potentially cause the formation of polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) in heat (combustion) processes. PCDDs and PCDFs can be formed in/after the preheater and in the air pollution control device if chlorine and hydrocarbon precursors from the raw materials are available in sufficient quantities. (See also section 1.2.3.3 Use of waste as fuel). The reformation of dioxins and furans is known to occur by de novo synthesis within the temperature window of cooling from 450 to 200 oC. Thus it is important that as the gases are leaving the kiln system they should be cooled rapidly through this range. In practice this is what occurs in preheater systems as the incoming raw materials are preheated by the kiln gases.

Due to the long residence time in the kiln and the high temperatures, emissions of PCDDs and PCDFs is generally low during steady kiln conditions. In Europe, cement production is rarely a significant source of PCDD/F emissions. Nevertheless, from the data reported in the document “Identification of Relevant Industrial Sources of Dioxins and Furans in Europe” there would still seem to be considerable uncertainty about dioxin emissions.

The reported data indicate that cement kilns can mostly comply with an emission concentration of 0.1 ng TEQ/Nm3, which is the limit value in the European legislation for hazardous waste incineration plants (Council Directive 94/67/EC). German measurements at 16 cement clinker kilns (suspension preheater kilns and Lepol kilns) during the last 10 years indicate that the average concentration amounts to about 0.02 ng TE/m3.

BAT measures: under normal circumstances emissions of VOCs and PCDD/PCDFs are generally low. Materials with high content of volatile organic compounds should not, if a choice is possible, be fed into the kiln system via the raw material feeding route and fuels with high content of halogens should not be used in a secondary firing. To minimise the possibility of PCDD/F reformation it is important that the kiln gases are cooled through the window of 450 to 200 oC as quickly as possible. If elevated concentrations of VOCs and/or PCDD/PCDFs occur, adsorption on activated carbon can be considered.

No specific measures foreseen in POP reduction strategy for PCDD/F in cement industry as extensive measures are already in place.

General primary measure for emission minimization in cement industry is careful selection and control of substances entering the kiln can reduce emissions. when practicable selection of raw materials and fuels with low contents of sulphur, nitrogen, chlorine, metals and volatile organic compounds.

Dioxins reduction possibilities

In previous chapters was given overview of dioxins reduction techniques in iron&steel and cement industries. At the same time there are lot of emission sources not so easy to control – uncontrolled combustion of agricultural waste, domestic combustion processes, minor industries, etc. Based on available data overall roughly 20 kg of PCDD/PCDF-TEQ are emitted unintentionally with about ¾ being discharged to waste and only ¼ emitted to air. This reflects the fact that a lot of activities have been taken in the industrial sector to establish effective flue gas treatment. Consequently air emissions are dominated by residential combustion in small combustion installations and open burning of waste. Wood preservation tends to be another important source for releases to air, which however already has been addressed by means of a legal ban for use of the relevant wood preservatives, so that this issue should fade out over time.

Major industrial sources in the field or air emissions of PCDD/PCDF are iron and steel and power production, with sinter plants and biomass power plants as major contributors. A consequent cycling of dusts and reduction of diffuse emissions from sinter plants and effective flue gas treatment in biomass combustion installations are seen as the most effective measures in this field.

The issue of POP releases into waste and the risk for releases to land is taken into account in the European POP regulation (setting limit values for irreversible destruction of the POP content), in the European waste directive with the subsequent European waste catalogue and the Landfill directive. This leads to the situation that most of the POP containing solid residues are send to controlled disposal installations from where releases to land are estimated to be low.

Due to low water solubility of PCDD/PCDF releases to water are low in comparison.

Possible measures to reduce dioxins emissions from different sources are given in European Commission document “Identification, assessment and prioritisation of EU measures to reduce releases of unintentionally produced/released Persistent Organic Pollutants. REFERENCE:O7.010401/2005/419391/MAR/D4. FINAL REPORT: 25 July 2006”:

General measures for industry
Specific measures for reduction of POP releases
I.1. Mandatory EVL and measurements for all 4 POPs in all IPPC facilities
I.2 Further elaboration and adaptation of BREFs in accordance with POP Regulation objectives
I.3 Inclusion of POPs in emission trading
General measures for release reduction
I.4 Expansion of IPPC Directive to cover sources < 50 MW
I.5 Mandatory annual inspections and regular instructions on proper use of combustion appliances
I. 6 Guidance for training of environmental inspectors
I.7 Funding of training for environmental inspectors
I.8 Financial incentives for installations that apply BAT (non IPPC installations)
Measures for filling knowledge gaps
I.9 IPPC Directive: Obligation to carry out dispersion modelling for POPs
I.10 Environmental certification related to POPs; closedloop / analysis; recovery rate
I.11 Dialogue with industry associations to promote new technologies
I.12 Information of Management and workers on BAT and BEP
I.13 Research in process technology concerning release reduction
I.14 Coordination of cooperation between concerned industry and universities
I.15 Lowering of threshold limits for reporting on HCB in E-PRTR regulation

First priority measures:
Overall
O.4. Promotion of environmentally sound practices for small combustion appliances
O.8. Development and promotion of a POPs release management handbook (BAT)

O.16. Establishment of a central institution for POP related issues ("POP coordination centre" within Commission Services)
O.30. Research on analysis and sampling methods for POPs
(none for target industries or general industry measures)

Second priority measures
O.5. Enforcement of Stockholm Convention requirements regarding improved coordination within/ in between national administration (NFP approach)
O.6. Information request on efficiency of the national legal system
O.7. Guidance for assessment of the efficiency of the national legal system
O.9. Research for substitute products and process technology to prevent formation and release of POPs
O.13. Review and extension of EU standards for POP sampling and analysis
O.14. Capacity building on POP monitoring and analysis
O.15. Platform for information exchange between Stakeholders (e.g. Consultative Forum)
O.21. Research on POP identification and detoxification techniques
O.29. Support of documentation on EF achievable with specific process technology
O.31. Research on relations between health effects and exposure to POPs

ANNEX A.6
Nature of installations reported to HELCOM in the Baltic States

ESTONIA

- **Glass industry**

1 plant (has IPPC permit), producing provides glass containers for foodstuffs, liquors, beers, soft drinks, chemicals, and pharmaceuticals. Products are mainly exported and the production volume has been increasing in previous years. Plant produces approximately 57000 tonnes/year (in 2004).
Hazardous substances used: Se, Co, Strantin. These substances are not mentioned in IPPC permit issued in 2004: under non-hazardous materials are mentioned oxides of Cu, Cr, V as additives to glass mixture; tables for hazardous materials are empty.

- **Pulp & paper**

1 plant (Horizon Pulp&Paper), has IPPC permit, produces unbleached kraft pulp using a batch cooking system. Company do not has own wastewater treatment plant, because the concentration of fibres in wastewater is low. Biological treatment plant for wastewater is operating. Unbleached stock uses environmentally sound chemicals.

2. In april 2006 BCTMP mill in Kunda (Estonian Cell) started operation producing 140 000 tonnes of aspen chemical-thermo-mechanical pulp mass per annum. Hydrogen peroxide is used for bleaching. Treated wastewater is discharged to the Baltic Sea, 1,5 km from coast.
IPPC permit foresees usage of DTPA 690 tonnes per annum as pulping and bleaching aid. This is a chelating agent diethylenetriaminepentaacetate (not classified as a hazardous substance), no specific emission data nor monitoring requirements.

- **Leather industry**

2 plants:
1. Nakro AS: Processing of cow raw hides into finished leather. Main production is chrome-tanned leather for shoe uppers. In small quantities are produced garment's leather and leather for belts. Export is 84-87 % (mostly to Russia and Byelorussia).
Production capacity is lower than IPPC pemitting threshold value. Company has rainwater discharge permit, process waters are discharged after treatment to Narva municipal sewery (i.e. Nakro permit does not contain any specific data on emissions nor treatment requirements). Actually variety of hazardous substances is used – the company was one of pilot companies for introducing IPPC in Estonia. According to data from 2000 preparations used in finishing could contain octylphenolethoxylates (brand RODA mod. – no CAS number provided in safety data sheet, but one of the substances is called octylphenoxypolyethoxyethanol, content in preparation 5-10 %)
Narva Municipal water company has permit to discharge to Narva River (2005-8): Cu, Zn a' 65,7 t/a, Pb, Cr(total) a' 16,4 t/a, Hg 1,64 t/a, Cd 6,57 t/a

2. Eurotann OÜ: Dressing and dyeing of fur, including tanning. Key products: Furskins, dressed. 100 employees.
Non-IPPC installation, located in Harju County. According to water permit company has to discharge wastewater to Keila municipal sewery (which is discharging to Keila River – Gulf of Finland). No data on hazardous chemicals used nor concentrations in wastewater. Company was established in 1991.
Keila municipal water company does not have specific data on discharge of hazardous substances (except phenolic compounds).

Enterprises do not use chlorinated organics such as SCCP and brominated flame retardants, nor NPEs
Both enterprises use own wastewater treatment plant before discharging theirs wastewater into the sewerage systems (municipal WWTP).

- **Fertilizers**

1 plant (Nitrofert AS), has applied for IPPC permit, processing natural gas into ammonia and prilled urea. Company discharges wastewater to municipal sewage system. Number of employees 480.

- **Metal surface treatment**

5 plants reported, 2 having IPPC permit
1. AS Norma: IPPC company, production of car safety systems and details. The technologies used for the main production are metalwork, plastic casting, and galvanizing of details. IPPC permit issued in 2003. Permit contains quite long list of hazardous chemicals, but galvanizing vat minor additives are given on one line. Using tetrachloroethen, no Cd and Hg. Using cutting oils 0,4 t/a (content not specified). Wastewater discharge after treatment to Tallinn municipal sewery.
2. Tarkon AS: Metal surface galvanizing as a minor activity (once had one of largest galvanizing factory in Estonia used for military purposes – Cd plating could be suspected in the past). Doesn't use Cd, Hg, Ag, tetrachloroethen and dichloromethane. Trichloroethene is used for cleaning of metal details, it will be outfaced in year 2007. Number of workers 506. Wastewater discharge to Tartu municipal sewery.
3. VG Holding AS: activities are galvanic treatment and metal product manufacture. Was operating in Soviet times at quite large scale. After privatisation: offering services on zinc coating (1993), electropolishing of stainless steel (1995), black oxidizing of steel (1999), aluminium anodising and coloring (1999), brass polishing (2001). In addition stamping work, chemical etching of a surfase of details made of stainless steel (2004), welding of details made of stainless steel (2005) and manufacturing of water-pipe connectors. Wastewater discharged to Võru municipal sewery. No data on hazardous chemicals used.
4. Vemo PK OÜ: Oxidation of steel and anodeerimine of aluminium, metal processing. Relatively small scale activity in Tartu, mainly dedicated to service apparatus building.
5. Galvex Estonia OÜ: IPPC company (status unclear): has applied for IPPC permit in 2005/6 but still operating with single media permits, specializes in the production of corrosion resistant, pure zinc coated (free of lead) sheet steel in commercial and structural grades typically used in the building industry. They are substituting Cr(III) compounds to Cr (VI)?. Water permit contains specific discharge conditions on zinc and phenolics. Discarging to Muuga port sewery. Composition of oils used while plating sheets could offer interest (processing speed is 200 m/minute, oiling consumes 0,5 – 2 g/m^2).

In addition, there is metal processing company **Vasar Ltd** in Maardu, having IPPC permit. Operating various electroplating processes: Zn (2 types), Cu, Ni, Sn, Cr. Using trichloroethylene for cleaning prior powder coating.

All the plants are discharging into the municipal WWTP and they use their own site treatment plants before discharging into sewerage.

In general, number of galvanising enterprises has decreased a lot in Estonia compared to Soviet times. Still, 5 companies reported to HELCOM could be too few, especially taking into account that Vasar was not mentioned. Also companies producing printec circuit boards should offer interest, as their have similar processes and chemical consumption as electroplating.

- **Oil refineries**

1 plant (Novotrade Invest AS), main activity in company is the production of petroleum chemistry products: technological lines for production of petrol, diesel and black oil. Considered non-IPPC, located on territory of VKG Oil in Kohtla-Järve.

- **Chemical industry**

7 plants reported
1. Velsicol Eesti AS: production of benzoic acid (esters), sodium benzoate and potassium benzoate.

2. Tallinna Farmaatsiatehase AS: production of medium solid medicaments (creme, gel).

3. Viru Liimid AS: is the largest manufacturer of complex chemicals and chemical products. The company main product comprise of urea formaldehyde resins of different modifications and liquid phenol formaldehyde resin used in the production of wood-chip wood-fibre boards, plywood.
4. VKG Oil AS: as a result of extraction of oil shale in gas generators process oil shale oil, rest-gas (generator gas) and production waste – oil shale low-temperature coke, phenol water and pitch waste. While processing epoxy resins the use of chloroorganics compounds hasn't been avoided.
5. Kiviõli Keemiatööstuse OÜ: mine of oil shale, production of oil products from oil shale, production of peat briquette and production of electricity and heat.
6. AS Repo Vabrikud: production of wood fibre board. It is not chemical sector. IPPC permit due to Estonian activities list .(if according to HELCOM building materials sector is considered chemicals, there are some other fibre board and also veneer producing companies too in Estonia)
7. Carboshale OÜ: production of main organic chemicals.

Estonian Chemical Industry is characterized by strong concentration, the largest part of the chemical industry has concentrated to East-Estonia. Chemical industry has concentrated to the thermal processing of oil shale. As a result of it shale oil, coke, shale oil phenols and other chemicals are produced.

All reported plants don't respond totally to the requirements in the Recommendation. Must be specified by plant

There are other enterprises in chemical sector, even having IPPC permits:

- Sadolin ES in Rapla (alkyd resins and paints). IPPC
- Distrei Group in Maardu (paints): non-IPPC but applied for IPPC permit in 2006
- Eskaro in Maardu (paints)
- Vivacolor in Tallinn (paints)
- Henkel Macroflex in Pärnu (foams) …

- **Textile industry**

1 plant (Kreenholmi Valduse AS), has IPPC permit: spinning of cotton yarn, knitting of fabric, finishing and sewing of textile product. Company produces and sells 100% cotton and cotton-polyester/viscose/linen yarns, produces bleached, dyed and printed fabrics made of cotton and cotton-polyester. Substitution of chemicals: active chlorine, AOX, Cr, Zn, Cu, PCB, PCP, As, Hg, trichlorobenzenes, APEOs - substances have been already substituted.
There is detailed list of hazardous substances in permit, but a lot without CAS numbers. It contains some hints that fluorpersulfonates and NPE could be in composition of preparations used.

Conclusion: there were reported only companies which could potentially emit some hazardous substances. There is difficult to say if these reported companies emit some substances as this specific information (on usage and emissions) was not asked.

LATVIA

Installations were reported to Helcom taking into account expert judgement in State authorities on installations, which could potentially emit the substances of concern.

- **Glass industry**

In the sector 1 IPPC and 2 non IPPC installations were reported. It reflect the real situation.
IPPC plant:
Valmieras Stikla šķiedras rūpnīca
Installations for glass (including glass fibre) production with smelter power more than 20 tonnes per day. Produces glass fibre, glass balls, technical textiles, threads. In 2006 a neto turnover of the company was 49.781milj.EUR. 97% of production is exported. Main exports are to – other EU countries, Japan, USA, Australia, Canada.

Non IPPC installations
Installations for glass (including glass fibre) production with smelter power less than 20 tonnes per day
Letglass
A company in Livani, which produces vases, sweet and fruit dishes, lamps, cups etc.
Hazardous substances used – cryolite, arsenic trioxide, Selenium, Cobalt oxide, Barium carbonate) di- sodium tetraborate.
Grīziņkalns
A company in Riga, which produces mainly lamps. Hazardous substances used are sodium nitrate, sodium sulphate, Alkali fluorosilicates(NH4), Antimonium oxide, Potassium carbonate, Zink oxide, ammonium hydrogen fluoride, Hydrogen chloride, Diarsenic trioxide.

- **Leather industry**

There are no IPPC installations in this sector in Latvia.

Non IPPC installations:
Installations with equipment for leather tanning with less than 12 tonnes ready product per year
Sia Dabiskā āda- Company treats animal leather Treated approx 14,5 tonnes of leather per year. Hazardous substances used in company are Acetic acid, Hydrochloric acid ... %, Sulphuric acid, Ammonia ....% Sodium hydroxide, Nonylphenol, Sodium sulphide, Chromiun sulphate, Cyanoguanidine-formaldehyde copolymer, Naphthalenesulfonic acids, Benzenesulfonic acid, Diisobutyl phthalate, Nitrocellulose, N-butyl acetate, 2,6 dimethylheptan-4-one, Butan-1-ol, Docusate sodium, Propan-2-ol,Castor oil, Lead chromate molybdate sulfate red, 2-butoxyethanol, Chlorocresol, ε-caprolactam, Amonium sulphate.
RITAL, Treatment of leather 200t in a month. Water is emitted according to contract with Jelgavas Ūdens (municipal company). Local waste water treatment facilities are under reconstruction (in order to eliminate Cr). No inventory of substances available.
Nākotnes ādminis Equipment for leather tanning less than 12 tonnes ready product per year
Operates on season basis – October-March Hazardous substances used Formic acid, Turpentine, oil, Propan-2-ol, Acetic acid ... %.
RikGer company has equipment for leather tanning less than 12 tonnes ready product per year. Hazardous substances: Formic acid, Turpentine, oil, Propan-2-ol, Acetic acid ... %

- **Metal surface treatment**

3 IPPC Installations

Metal producing and treatment:

Liepājas Metalurgs:

1) installations for cast iron and steel first or repeated melting, including continues teeming, with power more than 2.5 tons per hour
2) installations for black metal processing- hot rolling-mill, where more that 20 tonnes of unrefined steel is being processed
3) black metal foundry with power more than 20 tonnes per day

Installations with electrolysis or chemical processes for metal surface treatment and bath for treatment is more than 30 m3

Company employs 2800 workers. Neto turnover 290914967 EUR
Hazardous substances: Distillates (petroleum), naphtha-raffinate pyrolyzate-derived, gasoline-blending, Methane Lubricating oil, Gasoline, Naphtha, Gasoline, Benzene, Sulphuric acid ... %, Polychlorobiphenyls (in transformers).
Approx 60% water used in production after treatment are used repeatedly. Monitoring 1st emission point- waste water treatment through settling ponds
1st point measures:

- suspended matter
- COD, BOD
- Total N
- Total P
- Oil products
- Cu, Ni, Total Cr, Zn, Pb, Cd

2nd point measures:

- suspended matter
- COD, BOD
- Total N
- Total P
- Oil products

Rebir

Production of electrical instruments for building and construction.
Processes:

- cutting and flection of steel
- mechanical treatment
- welding, gridding (slīpēt)
- steel hardening
- aluminium and plastics teeming
- treatment of surfaces

Emission limit values set for:

- suspended matter
- BOD5
- COD5
- Oil products
- Fat
- Ptot
- Ntot
- Zn, Ni, FE, Cr tot

Krāsainie lējumi

1) installations for non-ferrous metal melting, including alloyage, where power is more than 4 tonnes of melted Pb and Cd per day and more than 20 tonnes of any other melted metal per day
2) hot rolling-mill, where more that 20 tonnes of unrefined steel is being processed
3) installations for covering metal alloy surfaces, which treat les than 2 tons per day

other facilities for iron, steel or other metal industrial treatment with area 1000 m2

Company has 250 workers. Hazardous substances and products - Oil paints and enamels Nitroenamels, Ground GF021
Monitoring requirements:
1st point:
- pH
- suspended matter
- COD
- Fat
- Oil products
- Ni, Zn, Cr Total, Cu, Cd, Pb

2nd point :
- pH
- COD
- Ni, Pb, Zn, Cd, Cu,
- Oil products

Other installations:

29 in total – installations were reported according to expert judgement those installations potentially emitting hazardous substances to water.

- **Chemical industry**

4 IPPC plants were reported – pharmaceuticals producers.
SIA "MedPro Inc"- plant located in Riga, producing pharmaceuticals, Inventory, Environmental action plan included in permit, specified need to reduce use of substances with R phrases 45,46,49,60,61. Company has 150 employees.
SIA "Reaģents A" – a pharmaceuticals plant located in Riga.
AS "Olain Farm"
AS "Grindeks"- top 1 pharmaceuticals producer in Latvia with turnover approximately 28 million EUR in 2006. Plant located in Riga.
MAIN FINANCIAL INDICATORS OF 2005
• sales 32,22 million lats (+30, 3 %)
• net profit 4,51 million lats (+ 81 %)
• gross profit 16,14 million lats (+ 69%)
MARKETS
• *Grindeks* production is exported to more than 40 countries
• Exports represent 92% of total sales amount
• Main markets for final dosage forms – Baltic States, Russia and other CIS countries, Japan, USA.
• Main export markets of Active Pharmaceutical Ingredients (API) – Europe, Japan, USA, Australia, Pakistan, India.
One company – Biolars was not reported as it did not have IPPC permit for the time being. The plant is located in a chemistry town Olaine, 25 km from the Latvian capital Riga. Company has 250 employees.
All are companies are producers of pharmaceuticals and basic chemicals.
36 – not possible to determine at the moment which installations were reported.

- **Textile industry**

1 IPPC
LAUMA FABRICS – textile finishing company. Currently company is not an IPPC plant anymore. Companies activities - production of textiles, treatment of textiles. Approximately 2200 tonnes of raw material are used in year.

Conclusion: The reporting was done basing on judgements of experts form State authorities about the companies, which could potentially emit hazardous substances to water. However specific information from companies was not asked.

LITHUANIA

The information below contains material about installations which were reported to Helcom. Information for reports has been gathered from Regional environmental departments, compiled by EPA, V. Beržinskas. There are also comments on data quality and completeness.

Rec. 14/3 – Glass industry

IPPC installations: 2. Only one installation has been reported about - "Kauno stiklas", producing glass bottles for drinks, total capacity is 60 million pieces per year. There are no heavy metals used, no Pb, As , or Sb has been found in wastewater. No Pb, As, Sb or F is emitted into the atmosphere or discharged into the wastewater.
The other IPPC installation - "Panevėžio stiklas" has not been included in the report.

Rec. 16/4, 17/8, 17/9 – Pulp and paper

IPPC installations: 3. Installations reported – (3) "Klaipėdos kartonas", "Grigiškės" and "Naujieji verkiai" have merged together though have separate permits and "Medienos plaušas" is non IPPC installation.
"Klaipėdos kartonas", has the major production output - 140,000 t/year, while other four installations account for 10 times lesser output. There are more than a thousand employees in the four enterprises.
They produce paper, cardboard, toilet paper, wrapping paper, boxes for eggs, board from wood fibre. No pulp is produced in Lithuania.

Rec. 16/7 - Leather

IPPC installations: 0. Installations reported (2) - "TDL oda" and "Odos gaminiai ir Co". Both are located in Siauliai city. "TDL oda" partially processing hides, no dyeing, uses non-ionic surface active substances from Poland, Italy – can contain NPE/NPEO. "TDL oda's" production volume - 1,805.9 t. Specific load of total Cr - 0.021 kg/t. Maximum concentration for total Cr - 1.6 mg/l.
"Odos gaminiai ir Co's" specific load of total Cr is 0.09 t/year. Maximum concentration for total Cr - 9.1 mg/l.
Neither "TDL oda", nor "Odos gaminiai ir Co" has discharged Cr directly to surface water.
"Šiaulių stumbras", "Natūrali oda" – not reported.

Rec. 17/6 - fertilisers

IPPC installations: 2. Installations reported (2) – "Lifosa", "Achema".
"Lifosa" wastewater – 2470000m^3/a, Emissions for Cd: 0,0012t/a and Hg: 0,2 kg/a. After initial purification in sedimentation (precipitation) in the lagoons, production wastewater is discharged directly into the surface water. General waste is discharged into the municipal sewage water collection system.

Employees – 1326+1046. Enterprises specialize in nitrogen and phosphorus fertilisers, sulphuric acid, methanol, phosphoric acid, nitric acid, ammonium nitrate, ammonia, urea (carbamate), polyvinylacetate emulsion etc.

"Achema": wastewater – 6023000 m^3/a, no Cd, Hg emissions. No wastewater treatment facilities are available on site. Rainwater and part of process wastewater (cooling process, etc. and slightly polluted waste water) is collected in the lagoon where, after sedimentation (precipitation), water is discharged into the surface water. Other production or general waste water is discharged into the municipal sewer and treated biologically.

In this 17/6 report to Helcom, there is a translation mistake – instead of "surface water", it is written "groundwater".

"Kemira-Lifosa" –an IPPC installation and "Arvi" –non IPPC enterprise are not included in the report.

Rec. 23/7 - metal surface treatment

IPPC installations: 0. Installations reported (8), plant names and types:

1. “Kauno ketaus liejykla” – ironworks.
2. “Vakarų cinkas” - hot zinc application (galvanising).
3. “Baltijos laivų statykla” - ship building, production of painted steel panels, production of ship forecastles.
4. “Telga” -production of printed circuit boards.
5. Public company at Marijampolė correctional institution - electrochemical metal surface treatment.
6. “Fasa” - electrochemical metal surface treatment.
7. “Panevėžio aurida” - production of automobile compressors, aluminium moulding, mechanical treatment of parts.
8. “Rokiškio mašinų gamykla” - metal treatment by using metal cutting machines, painting of metal parts, wire or electrode welding, timber processing.

Different products vary in these enterprises – metal details, compressors, ship repairing, printed circuit boards (“Telga”), food automatic machines, equipment for agriculture, cast iron foundry.
None of substances mentioned in 1.1 of Rec. (NPE, Cd, Hd, chlorinated organics) are used. Products used for degreasing: "Simple Green D", detergent M-13, hydrate of sodium, liquid glass. Three plants do not produce wastewater. In the rest of the plants, the pollution of waste-water complies with the conditions of the Recommendation, except for “Telga” where concentration of copper in waste water exceeds the norm.
Three companies have implemented the environmental management system ISO 14001.
„Kauno ketaus liejykla“ – IPPC to be issued. The Kaunas Regional Environmental Protection Department has asked to correct the permit application. Mistakes were not related to hazardous substances.
Rec. applies to plants having electro- or chemical plating, so, in LIT we have more such plants than listed in the report to HELCOM. Metal industry in LIT (Source - http://www.linpra.org/index.php/en-->):

- Surface treatment (painting, plating): ~80 enterprises,
- Metal processing (mechanical): ~80 enterprises,
- Metal processing (cutting..): ~100 enterprises.

Rec. 23/8 – oil refineries

IPPC installations: 1. Installation reported (1) - “Mažeikių nafta”.
Production - oil products. 3451 employees. Wastewater - 3 090 000 m^3/y. Complying with the requirements of the Recommendation.

Rec. 23/11 – chemical industry

IPPC installations: 1. Installation reported (1) - “NeoGroup plant Klai-Pet”.
Activity — production of polyethylene terephthalate (PET) granules used to produce packaging for food and medical products.
Design capacity - 154,000 t/year. The company launched its activity on 1 February 2003. It has implemented the quality management standard ISO 9001:2000 and the environmental management standard ISO 14001:2004. Prior discharging wastewater to municipal WWTP, it is treated in the biological treatment facilities of the plant (capacity — 494 m^3/d) to reduce BOD_7 and COD.

Rec. 23/12 – textile

IPPC installations: 2. Installation reported (6) - IPPC: (2) - „Alytaus tekstilė“ and „Linas Nordic“ and non IPPC - “Vernitas”, „Siūlas“, „Baltic Mills“, „Utenos trikotažas“.
Three plants has applied BAT - „Alytaus tekstilė“, “Siūlas”, and “Utenos trikotažas”.
Processes - dyeing, printing, impregnation, coating, processing against crumpling.
Surface-active agents in „Alytaus tekstilė“ are used only for rinsing fabrics dyed in dark colours (very few cases).
“Utenos trikotažas” and “Siūlas” fully comply with the requirements of the Recommendation.
Textile finishing companies:

1. “Alytaus tekstilė”
2. “Utenos trikotažas”
3. “Siūlas”
4. “A grupė”
5. “Audėjas”
6. “Klasikinė tekstilė”
7. “Linas”
8. “Linų audiniai”
9. “Tributum”
10. “Liningas”
11. “Linas Nordic”
12. “Liteksas”
13. “Vernitas”

Impregnated and coated fabrics – “Alytaus tekstilė”, “Audėjas”, “Klasikinė tekstilė”, “Linas Nordic”, “Tributum”.

Rec. 24/4 – iron and steel

IPPC installations: 1. Installation reported (0) – non.
“Kauno ketaus liejykla” is in process of issuing the permit.

ANNEX A.7

Glossary of referred norms and standards in the Russian Federation

Abbreviation and term in English	**Term in Russian** (abbreviation, full name and definition)	**Meaning in English**	**Remarks**
CONCENTRATIONS			
PDK Maximum Allowed Concentrations	ПДК (Предельно допустимая концентрация) концентрация веществ в воде, выше которой вода непригодна для одного или нескольких видов водопользования (ГОСТ 27065-86)	concentration of a pollutant in water, exceeding which the water is not with appropriate quality either for one or several types of water use (GOST 27065-86)	Different quality standard figures for drinking water, waste waters, and water bodies used for communal and cultural needs and, separately, for fishery. Proven by relevant research / measurements and officially established as a norm
PDK for water body used for fishery purposes	экспериментально установленный рыбохозяйственный норматив максимально допустимого содержания загрязняющего вещества в воде водного объекта, при котором в нем не возникают последствия, снижающие его рыбохозяйственную ценность (Приказ Госкомрыболовства России 14.08.1995 N 12-04-11/454)	experimentally determined fishery norms defining maximum allowable concentration of the pollutant in water body than no any negative consequences are following and its (water body) fishery importance is not decreasing (Order of State Committee on Fishery 14.08.1995 N 12-04-11/454)	Maximum allowable concentrations for fishery waters
Hygienic norms - PDK for water bodies used as drinking water supply sources and for cultural-communal needs	устанавливают предельные допустимые концентрации химических веществ в воде водных объектов хозяйственно-питьевого и культурно-бытового водопользования распространяются на воду подземных и поверхностных водоисточников, используемых для централизованного и нецентрализованного водоснабжения населения, для рекреационного и культурно-бытового водопользования, а также питьевую воду и воду в системах горячего водоснабжения (Постановление Минздрава РФ от 30.04.2003 г. N 78)	PDK for water bodies (both surface and ground), used for drinking water supply, communal needs and recreation, and for drinking water itself, used also for hot water supply systems.	Based on experimental toxicity, sanitary norms for water bodies, and taking into account international research.

Abbreviation and term in English	Term in Russian (abbreviation, full name and definition)	Meaning in English	Remarks
OBUV Tentative Safe Levels of Impact	ОБУВ (Ориентировочно безопасный уровень воздействия - временный рыбохозяйственный норматив, необходимый для решения вопросов о допустимости закупки за рубежом, организации производства, использования того или иного соединения в народном хозяйстве с последующим установлением допустимого уровня его содержания в воде рыбохозяйственных водоемов. (Приказ Госкомрыболовства РФ, от 28.04.1999 г. N 96)	temporary concentration of the pollutant in the water body used for fishery purposes	(might be used for air as well) Calculated, not measured. Based on experimental studies, other norms and chemical characteristics) Used if PDK is not available and valid for two years
VDK (ODU, ODK) Temporary allowable concentrations (TAC)	ВДК (ОДУ, ОДК) (временно допустимые концентрации - Ориентировочно допустимый уровень и Ориентировочно допустимая концентрация.	see above Used if PDK is not available	Calculated, not measured. Based on experimental studies, other norms and chemical characteristics)
NORMS AND STANDARDS			
SanPiN Sanitary-Epidemiological Rules and Norms (SERN)	СанПиН (Санитарные правила, нормы и гигиенические нормативы (далее - санитарные правила) - нормативные акты, устанавливающие критерии безопасности и (или) безвредности для человека факторов среды его обитания и требования к обеспечению благоприятных условий его жизнедеятельности)	State rues, norms and hygienic standards setting the criteria towards environment and living/working conditions in order to ensure safe human being. Used as water supply requirements, for setting sanitary-protection zones etc.	Developed on the official level and mandatory
GOST State Standard (SS)	ГОСТ (Государственные стандарты – по качеству, в т.ч. воды, методам определения и пр.)	state standards, mainly referring to drinking water quality measurements and setting some norms in this regard (i.e. technical standards for distilled water etc.)	Used mainly for measurements as technical regulations
IMPACT			
PDVV maximum allowable negative impact (MANI) Due to new regulations, not existent anymore and replaced with PDV (see below)	ПДВВ (Предельно допустимое вредное воздействие на водный объект - предельный уровень воздействия хозяйственной и иной деятельности на водный объект, при котором сохраняется естественная структура и нормальное функционирование экосистемы и не причиняется вред здоровью населения)	Limiting level of anthropogenic impact on the water body which allows to keep natural structure and functioning of ecosystems and maintain human health	It was not widely used (only one PDVV was developed) due to complicated and not clear process; moving towards PDV (maximum allowable impact) to be developed and introduced this year according to the new Water Code

Abbreviation and term in English	**Term in Russian** (abbreviation, full name and definition)	**Meaning in English**	**Remarks**
PDV Norms of allowed impacts on water bodies (NAI)	ПДВ (нормативы допустимого воздействия на водные объекты - допустимое совокупное воздействие всех источников, расположенных в пределах речного бассейна или его части, на водный объект или его часть (Постановление Правительства РФ от 30.12.2006 г. N 881)	Allowed overall impact of all pollution sources located in the water basin (or its parts) into the water body or its part (Order of the Government, 30.12.2006 г. N 881)	Developed on the base of PDK for pollutants, microorganisms, etc. In water bodies Should be developed by the Federal Water Resources Agency
LIMITS (for individual enterprises)			
PDS Maximum Allowable Discharge (MAD)	ПДС (Предельно допустимые сбросы загрязняющих веществ со сточными водами – максимально разрешенная к сбросу, в определенное время и в определенном месте, масса загрязнителей, которая обеспечивает соблюдение стандартов качества вод	mass of substance in waste water, maximum allowable to discharge with distinguished conditions in a unit of time in a given place of a water basin with the purpose of provision water quality standards in a control point	currently is issued for 5 years, than should be renewed These norms are established taking into account that PDK could not be exceeded in water bodies Both concentrations and volumes must be respected by the enterprise (i.e. it can't exceed PDK even if it still has some "permitted tones" left).
Emission limits for pollutants and microorganisms	ограничения сбросов загрязняющих веществ и микроорганизмов в окружающую среду, установленные на период проведения мероприятий по охране окружающей среды, в том числе внедрения наилучших существующих технологий, в целях достижения нормативов в области охраны окружающей среды (ст. 1 N 7-ФЗ от 10.01.2002 г.)	Emission limits for substances and microorganisms into the environment which are established for the period of performing environmental protection measures, including BAT, aimed to reach environmental norms (Federal law N 7 dated by 10.01.2002 y)	Established only than environmental actions plans are available. Such plans should be agreed with relevant state environmental authorities.

ANNEX A.8:

Occurrence and characteristics of some target hazardous substances on Russian market

I Nonylphenol ethoxylates

Nonylphenol (and octylphenol) ethoxylates are present in product OP-7: non-ionogenic surfactant, produced by reaction of mixture of mono- and dialkylphenols with ethylene oxide (length of alkyl chain 8-12 carbon atoms).

OP-7 is liquid or paste-like substance, colour yellowish to brownish. It is mostly used as emulsifier, moistering additive and soap in various technological processes (plastic, construction etc) industries. Use specifications given in national standard GOST 8433-81.

Following producers have been detected in Russian Federation (none of them in NW Russia):

- Company “Vitahim” Dzershinsk Factory (Nizhegorodskii oblast)
- Factory in Niznii Novgorod
- Company “Salavatnefteorgsynthesis” (Bashkirostan Republic)

II Liquid chlorinated paraffins

There is a variety of chlorinated paraffins on Russian market. Technical requirements TU 6-01-16-90 / TU 2493-379-05763441-2002 specify use conditions for ХП-13, ПАРАХЛОР-250, ХП-418, ХП-470, ХП-52. Chemical formula for these mixtures is:

$$C_nH_{2n+2-x}Cl_x, \text{ where } n = 10\text{-}30;\ x = 1\text{-}7.$$

ХП-13: white-yellowish to brownish viscous mass with M_r = 305, chlorine content 12…14 %; used in production of lubricants and diesel fuel.

ПАРАХЛОР-250: yellowish to brownish oily liquid with M_r = 250, chlorine content 12…14 %; used as fat liquoring agent in leather tanning.

ХП-418: yellowish to yellow oily liquid with M_r = 305, chlorine content 24…29 %; used as secondary plastificator in PVC production.

ХП-470: clear transparent oily liquid with M_r = 461, chlorine content 40…43 %; used as secondary plastificator for light-coloured polymers production.

ХП-52: chlorine content 50,5-53 %; used as a PVC plasticiser in cable coating industry.

They are considered relatively harmful substances from hazard class IV, except ХП-470 having hazard class III.

Also CAS No 63449-39-8 is related to these substances.

There are 3-4 producers identified, none of them located in NW Russia.

III Perfluorinated compounds

A producer of perfluorinated compounds was identified in Ural region, producing perfluorinated compounds upon request. Among these compounds are several perfloralkylated substances, none of them being registered or having PDK elaborated:

- perfluorbenzoic acid (TU 6-00209409-032-96)
- perfluorpentanoic acid (TU 301-14-3-89)
- perflurooxycaprylic acid (perfluro-2-methyl-3-oxaoctanoic acid, TU 2431-059-00209409-2000)

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