MANAGEMENT OF CHEMICALS AND PESTICIDES IN SWEDEN

National Profile

Prepared by

KemI - The Swedish National Chemicals Inspectorate, Solna, Sweden

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Size of the Country: 450,000 sq. km (174,000 sq. miles)

Form of Government: Constitutional monarchy and parliamentary state with one legislative house

Official Language: Swedish

Total Population: 8 854 000

Urban Population: 84%

Rural Population: 16%

Literacy Rate: virtually 100%

Education of population age 16-64: primary 30%, secondary 44%, some form of post-secondary (tertiary) 23%

Administrative divisions: 289 municipalities (Sw. kommuner), 25 provinces (Sw. landskap), 21 counties (Sw. län), 20 county councils (Sw. landsting), 10 labour inspection districts (Sw. yrkesinspektionsdistrikt) , 61 natural agricultural areas (Sw. naturliga jordbruksområden)

The Swedish Government, the Swedish Institute, the Swedish EnviroNet, and most chemicals management stakeholders have websites with useful information in English, see
www.regeringen.se/inenglish/index.htm;
www.si.se/eng/esverigex.html;
www.smn.environ.se/miljonat/english/index.htm;
and Appendix 2, below.

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An Interim National Profile was drafted by the Swedish National Chemicals Inspectorate in February 1997. Several chemicals management stakeholders provided data or texts for the first draft version. Due to major new environmental legislation, the Profile was updated in March 2000 and again circulated for comments. The present version was prepared in July 2000 by George Ekström (profile co-ordinator and editor), Christina Bouvin, Ulla Linder and Margareta Östman.

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1. Production and Use of Chemicals [1]

Introduction

Swedish chemical industry has been internationally active for more than one hundred years. The Swedish inventor Alfred Nobel, one of the original entrepreneurs, built his first nitro-glycerine factory as early as in 1864. Nobel's great commercial success in the production of new types of explosives constituted the basis of the famous Nobel prizes.

The chemical industry grew to an important element of the Swedish economy during World War II. For the past fifty years it has outstripped most other major domestic industries in its rate of growth. During the past ten years pharmaceuticals represent the most successful section of the chemical industry. In 1998 38 700 persons were employed in the chemical industry . In the beginning of the 1990s the number amounted to approximately 38 000. The number of employees decreased the following years and bottomed in 1994 with around 33 000 persons employed in the chemical industry. The increase since then is due to a very positive development of the pharmaceutical industry. With the wider definition of chemical industry, i.e. including the petroleum refineries, and the rubber and plastic industries the total number is 63 800 persons.

In 1996, the market value of chemical production amounted to approximately SEK 75 000 million. For the total group, the value of the market is SEK 110 000 million with a value added of 40 %, which can be compared to 35% of the total industry. The total industrial production in Sweden reached the value of SEK 1090 000 million and the chemical industry stands for 6,9% (10,1%). The total number of employees in the industry is about 695 000, which makes the chemical industry amount to 5,4% (9,2%) of the working force.

Table 1A shows production and trade figures for 1994/95. Sales values and number of employees in various chemical industry sectors are shown in Tables 1B and 1C. Major chemicals by total quantity and number of products, respectively, are shown in Table 1D. Tables 1E and 1F show numbers and quantities of chemical products classified as dangerous to health or the environment, respectively.

Foreign trade

Swedish exports of chemicals in 1999 amounted to approximately SEK 72 800 million, i.e. 10 % of Sweden's total exports or equivalent to 75 % of the value of the entire chemical production in Sweden. Imports reached approximately SEK 69 400 million in 1999. Since 1997 the export of pharmaceutical has increased by 40%. The pharmaceuticals represent nearly 5% of the total value of exports and about 60% is exported to other European Union member states.

[1] Text based on ”Chemical Industry in Sweden – Facts and Figures”, Association of Swedish Chemical Industries, May 2000 (draft)

Industrial structure

Chemical production is concentrated in about 50 plants belonging to some 20 companies clustered either in the far south of the country or in the Gothenburg, Karlskoga and Stockholm areas. There are also a few factories in the north, where pulp mills provide inter alia useful by-products as well as a market for process chemicals.

In the 1980s there were a number of mergers and acquisitions within the chemical industry in Sweden in order to rationalise production, optimise research and development, and to facilitate international marketing. Since then there is normally only one main manufacturer of each high volume chemical in Sweden. The chemical industry in Sweden in the past often used to be a part of an industrial group which had its main interest tied to pulp manufacturing. In 1990, the last important aggregate of this type was disintegrated, when the most important pulp industry (Stora AB, now Stora Enso) sold its chemical division.

Already in the 1980s, an important part of the basic chemical industry (e.g. inorganic compounds, fertilisers, petrochemicals and polyolefines) was acquired by Norwegian and Finnish companies. As a consequence of the rapid globalisation of the chemical industry in the 1990s, most chemical industries are now owned by foreign interests. The largest Swedish chemical industry (Nobel Industries AB) in 1994 merged with the Dutch company Akzo to form Akzo Nobel with head office in the Netherlands. In 1995 the second largest pharmaceutical company in Sweden (Pharmacia AB) merged with the American company Upjohn to form Pharmacia & Upjohn with head office in London. In 1999 both AGA and Astra got new owners. AGA was bought by the German firm Linde. Astra was merged together with Zeneca to form AstraZeneca, one of the biggest pharmaceutical companies in the world. The remaining large Swedish-owned chemical companies are Beckers and Perstorp.

The chemical industry and the environment

As to fulfilling environmental targets set by laws and regulations, the chemical industry is a ”key” branch also in the sense that it is able to solve pollution problems – both emissions and waste – not only within the chemical industry itself, but also for other industries and for the public sector. Research and development undertaken or sponsored by chemical enterprises have resulted in the marketing of new, more efficient and economically viable water treatment chemicals, catalysts for car exhausts, of adsorbent materials for the treatment of air pollution (zeolites) and also in new systems for bleaching of pulp without the use of elementary chlorine, etc. Chemical sewage and treatment plants were introduced on a large scale in Swedish municipalities as early as in the beginning of the 1970s, giving the Swedish chemical industry a lead in the development of water treatment chemicals.

The Chemical industry in Sweden has a long tradition of working with continuous improvements of its environmental performance. Already in 1991 Responsible Care, the chemical industry’s commitment to continual improvement in all aspects of health, safety and environment performance, and to openly communicate its activities, achievements, plans and targets, was introduced in Sweden. The Association of Swedish Chemical Industries supports member companies in their work with Responsible Care. As of today more than 130 companies are participating in the Responsible Care

programme.

The importance paid to environmental matters, can also be illustrated by the fact that many Swedish chemical industries have adopted environmental management systems according to ISO 14001 and/or EMAS – the European Union Eco-Management and Audit Scheme. In addition, a great number of companies are in the process of introducing such systems.

An annual report is published about the Responsible Care work in the companies, which follow about 30 different parameters. The Progress Report compares the data from 1998 with the particulars from 1994, 1995, 1996, 1997 and the reference year 1990. For the 125 companies in the Responsible Care programme that were included in the latest survey, the results can be summarised as follows:

- A continuing decrease of emission to air
- A 50 % reduction of emission of nitrogen oxides since 1990
- More than 55 % of the companies have ISO 14001 and/or EMAS in place
- 50 % of the companies offer their customers training in how to handle their products in a safe manner
- More than 60 % of the companies publish an in-house environmental report

Technology and research

The chemical industry counts for approximately 20 per cent of the total R&D (Research and Development) in Sweden. The number of scientists with a higher academic degree, engaged in R&D in the chemical industry was 1 200 in 1997. The total number of employees in the R&D sector of the chemical industry is 6 300 compared to the total number of 35 500 in the industry, which is 18% of the total. Chemical industry in general and pharmaceutical industry in particular has considerably increased their R&D activities. In 1997, the total R&D costs in the chemical industry in Sweden amounted to SEK 8 075 million, out of which as much as SEK 7 179 million was spent by the pharmaceutical industry.

Innovative companies are mostly located in ‘technical parks’ close to the institutes of technology in Gothenburg, Lund and Stockholm, namely Chalmers Teknikpark, Ideon and Teknikhöjden, respectively. The number of biochemical industries has increased significantly over the last years in the Lund, Uppsala and Göteborg areas.

Inorganic chemicals

Since the beginning of the 19th century sulphuric acid has been produced in industrial scale in Sweden. The first plant, located to Gripsholm outside Stockholm, had a capacity of about 4 tons per year. Production capacity is today around 500 000 tons per year, divided between plants in Helsingborg (Kemira Kemi AB) and in Skellefteå (Boliden Mineral AB). Minor quantities are obtained in some companies as result of desulphurisation processes. In 1998 the Swedish consumption of sulphuric acid was 687 000 tons.

For many years pyrite – a mineral in plentiful supply in Sweden – has been used as the main raw material for the production of sulphuric acid. However, since 1992 the sulphuric acid production located to Helsingborg is based on elementary sulphur available from refinery desulphurisation processes and from virgin sulphur deposits in e.g. Poland.

Sulphuric acid is used by Kemira Kemi for the production of hydrochloric acid and various other chemicals, mainly potassium sulphate, aluminium sulphate and sodium sulphate as well as oleum. These sulphuric acid-based chemicals are used in the production of pulp, detergents, mineral feeding-stuffs, for the treatment of waste and sewage water, and for many other purposes. Sulphuric acid is also an important chemical used to facilitate organic reactions. Kemira Kemi is also producing other inorganic chemicals, e.g. calcium chloride and calcium phosphate.

Fertilizers are produced by Hydro Agri AB in Landskrona and Köping. Dilute nitric acid for the production of fertilisers, explosives etc is produced by Dyno Nobel Europe in Ljungaverk, and by Hydro Agri AB. Concentrated nitric acid (approximately 10 000 tons per year) is produced by Dyno Nobel. Dyno Nobel Europe Ljungaverk and Hydro Agri in Köping produce ammonium nitrate in large quantities to be used in explosives. Ammonium nitrate is available in melted form, in crystalline form and in so called prills. The Swedish consumption of ammonia was 287 000 ton in 1998, nearly all of it imported.

Alufluor AB is the single producer of aluminium fluoride, a chemical demanded for the production of aluminium from bauxite. High volume inorganic chemicals such as alkali, chlorine and chlorate, are yielded by electrochemical processes requiring large amounts of electricity. The first electrochemical plants were built during the 1890s. Access to cheap hydroelectric power put Sweden in a good competitive position. In the 1980s and in the beginning of the 1990s electricity prices have increased significantly, constituting some difficulties for the electricity intensive industry in Sweden. Eka Chemicals in 1997 decided to expand their production of the most electric intensive product, sodium chlorate, in Norway.

Chlorine and alkali are obtained in roughly equal amounts by the electrolysis of salt. Chlorine is mainly used in the production of PVC resin and hydrochloric acid, but is also used for many other applications, e g in the organic chemical industry. Sodium hydroxide (alkali) is a chemical with a wide range of uses in many industries, for example the pulp industry. The consumption of chlorine in Sweden in 1998 was 239 000 ton and of sodium hydroxide 386 000 ton. The Swedish consumption of hydrochloric acid was 161 000 ton in 1998.

Chlorine was largely used for pulp bleaching up to the end of 1980ies in Sweden. Nowadays this application has totally disappeared for environmental reasons. A restructuring of the chlorine-alkali industry followed in the 1990ies including the closing of three plants. Today there is only one remaining company producing chlorine for sale, namely Akzo Nobel Base Chemicals, with sites in Bohus and in Skoghall, Karlstad. From chlorine, Akzo Nobel Base Chemicals is producing 130 000 tons of hydrochloric acid and also monochloro acetic acid. Hydro Polymers, Stenungsund, produces chlorine but only for its own needs, namely production of polyvinyl chloride and ethylene dichloride. Eka Chemicals in Bohus manufactures pure grade potassium and sodium hydroxide as well as ferric chloride.

In the pulp bleaching process, chlorine has been replaced by chlorine dioxide, hydrogen peroxide, oxygen, ozone and peroxyacetic acid in different combinations, depending on various factors such as type of wood, type of process, properties of the final fibres and desired level of bleaching. Chlorine dioxide is produced on the sites from sodium chlorate. In 1995, the production of sodium chlorate was 100 000 tons. The production capacity of hydrogen peroxide has grown rapidly in the 1990s. Eka Chemicals is the largest global manufacturer of sodium chlorate and the only manufacturer in Sweden. Hydrogen peroxide is produced by Eka Chemicals in Alby and

Bohus and by Kemira Kemi in a plant in Helsingborg. Eka Chemicals has recently started production of peroxyacetic acid in Bohus.

A historically interesting, but today fairly small chemical, is potassium chlorate mainly used for safety matches, a more than one hundred years old Swedish invention. For quite some time, a Swedish-owned company was the world's largest manufacturer of safety matches. Eka Chemicals is now producing approximately 10 000 tons per year of potassium chlorate.

Calcium carbide is manufactured by Casco Products AB in Sundsvall at a yearly quantity of approximately 50 000 tons. Calcium carbide is used e.g. for desulphurisation in steel production and for conversion into welding gas (acetylene).

Silica particles and various types of silicates found new and interesting commercial applications during the 1980s. The silica particles combined with a cationic starch have turned out to be very effective as retention and dewatering agents at the wet end of paper machines. Eka Chemicals, with a long tradition in silicates, has developed and patented this world-wide utilised retention system. Eka Chemicals has also developed very fine silica-based particles (Kromasil) to be used in separation columns for high performance liquid chromatography.

Sodium and potassium silicates are produced by Akzo-PQ Silica Skaftkärr in Karlstad. Silicates are used as ingredients in detergents, and in the pulp bleaching process. Askania AB in Lödöse is another manufacturer of silicates.

Explosives

Ever since Alfred Nobel founded his factory for the production of nitroglycerine, the Swedish explosives, ammunition and detonator industry has been successful. Producers of ammonium nitrate for the explosive industry are Dyno Nitrogen Ljungaverk and Hydro Agri Köping. Both companies now have Norwegian owners. The production of explosives is concentrated to three companies, namely Nexplo Bofors AB, Dyno Nobel Sweden AB, and Kimit. The consumption of ammonium nitrate in Sweden was about 30 000 ton in 1998.

Oil-based chemicals

By a strategic decision in the early 1960s, a petrochemical centre was established at Stenungsund some 50 kilometres north of Göteborg. As Sweden has no mineral oil or gas deposits, the supply of all raw materials for the petrochemical industry is dependent on imports.
The Stenungsund cracker, where light naphtha or gas condensates are converted into ethylene and propylene, has a 610 000 tons per year capacity of ethylene and 205 000 tons per year of propylene. It is run by Borealis AB owned jointly by OMV (Austria), International Petroleum Investment Co (Abu Dubai) and Statoil A/S (Norway). Borealis also has a plant for the manufacture of methyl tert-butyl ether (MTBE) with a 48 000 tons per year capacity to utilise by-products (butene) from the cracker. MTBE is used in gasoline to enhance octane numbers.

Most of the ethylene from the cracker is used for the production of polyethylene of various grades at two plants also belonging to Borealis. The accumulated production capacity for polyethylene is about 440 000 tons per year with ample production flexibility according to market demand for the

various grades. It is the largest plant in the Nordic countries. Borealis is specialised in the production of polyethylene for pipes and cable insulation.

The ethylene from the cracker is also the basis for an EDC/VC/PVC plant at which approximately 150 000 tons of polyvinyl chloride (PVC) were produced in 1997. The other main raw material for the PVC production is chlorine obtained through electrolysis of salt. Most of the PVC is used in buildings (coatings of roofs, floors, pipings and cable insulation). There are a range of PVC-grades, to which often are added different types of additives, e g to obtain soft and flexible products for tubes etc. The PVC-plant is owned by the Norwegian company Hydro ASA and operated by its subsidiary Hydro Polymers AB.

The ethylene is furthermore used in an ethylene oxide plant with a production capacity of 80 000 tons per year. Ethylene oxide is modified to a number of products, e.g. polyethylene glycols for the production of non-ionic surfactants. A 60 000 tons per year ethanol/ethylene amine plant is linked to the ethylene oxide plant. Also, there is a plant for the production of piperazine. This part of the petrochemical centre is owned by Akzo Nobel Surface Chemistry AB, a subsidiary of Akzo Nobel.

Propylene from the cracker is mainly used in an oxo-plant producing butyraldehyde and butanol (capacity 300 000 tons). There is no Swedish plant producing polypropylene. The aldehyde is to a large extent converted to 2-ethylhexanol (octanol). Phthalate plasticisers are manufactured from 2-ethylhexanol. Isobutyraldehyde is also produced in the oxo-plant and is used as an intermediate for the production of polyols. In a multipurpose plant there is production of 2-etylhexanoic acid (largest producer in the world) or propionic acid with a total capacity today of 45 000 tons per year. The oxo-plant was inaugurated 1980 and is the only one of its type in Scandinavia. The plant is owned by the investments company Industri Kapital. Some 85 % of the production at Neste Oxo AB is exported.

The Stenungsund centre is served by an oxygen/nitrogen gas plant with a capacity of splitting 75 000 m^3 air per hour. Similar gas plants are installed around Sweden to supply gas for pulp industries, steel industries, etc. The main gas company is AGA Gas.

The only production of carbon black in the Nordic countries is situated in Malmö, at Nordisk Carbon Black AB, subsidiary to Degussa AG. Current capacity is rated at approximately 35 000 tons per year. The main raw materials origins from Borealis in Stenungsund. Carbon black is used in rubber manufacturing as a filler and as a pigment for paint, ink polish, etc.

The only polystyrene plant, with a production capacity of 65 000 tons per year, is situated in Trelleborg and owned by BP Chemicals since the beginning of 1998. It operates with a feedstock of imported styrene monomer and exports approximately 80 % of its production.

Wood-based chemicals

Sweden is largely covered by forests as well as by numerous lakes and rivers. The forests are not only the basis for the wood, pulp and paper industries, but also for organic chemical production. Although the petrochemical industry has been by far the largest and most expanding organic basic chemical industry since the mid-1960s, the wood-based chemical industry has expanded slightly during the last decade. The spent cooking liquor from the sulphite pulping process

contains fermentable sugar, suitable for conversion into ethanol. There is one such plant at Svensk Etanolkemi AB in Örnsköldsvik with an annual capacity of 10 000 tons of ethanol. Svensk Etanolkemi is also manufacturing acetaldehyde (25 000 tons per year), acetic acid (20 000 tons per year) and ethyl acetate (25 000 tons per year). Domestic production of ethanol is insufficient for the production of downstream products. Consequently, 40 000 tons per year of ethanol is imported.

Another by-product from spent sulphite liquor is lignosulfonate produced by LignoTech AB in Vänersborg, a subsidiary of the Norwegian Borregaard A/S. Annual production capacity in Sweden is 40 000 tons per year of powder and 20 000 tons per year as liquid (50 %). Lignosulfonates have different applications, e.g. as additives in concrete and in feeding stuffs, as dispersants in pesticides and mortars. LignoTech is also producing 'kraftlignin' from spent sulphate cooking liquor. Kraftlignin is used as a dispersant for textile dyes at high temperatures.

Crude tall oil is another important by-product of the pulping process. It is distilled into resin acids and fatty acids. Arizona Chemical, owned by International Paper, USA, is the only refiner in Sweden of tall oil, having a distillation capacity of 140 000 tons per year in its plant in Sandarne, Söderhamn. Resin acids are further modified into rosins, 'tackifiers' and other products for paper, paints and even chewing gum, etc. Fatty acids have many different applications, e.g. in the manufacture of alkyd resins widely used in paints.

Commercially interesting products are obtained by special treatment of high quality cellulose, namely carboxymethyl cellulose (CMC), and ethylhydroxyethyl cellulose (EHEC), which have quite a number of applications, e.g. as thickeners in latex paints, in cosmetics and in ice-cream, as anti-redeposition agents for detergents and as water retention aids. The annual production capacity of CMC amounts to 20 000 tons and the capacity of EHEC to 20 000 tons. CMC is manufactured by Noviant AB in Skoghall and EHEC by Akzo Nobel Surface Chemistry in Örnsköldsvik.

Production of rayon from cellulose is another example of a wood-based chemical industry. The only rayon fibre producing company in Sweden is Svenska Rayon AB, situated closed to Karlstad and with a capacity of about 25 000 tons per year. Most of the rayon supply is met by demand from production aimed for hygienic purposes.

Organic chemicals from agriculture

The refining of vegetable fats and oils (capacity over 200 00 tons per year) has by tradition been used for the production of margarine, ice-cream and similar alimentary products. Karlshamns AB, the single Swedish company in this field, is a large producer of vegetable fats as alternatives to cocoa butter in sweets and furthermore of fatty acids (capacity 42 000 tons per year) and glycerol (5 000 tons per year).

The demand for starch by the paper industry has increased rapidly during the last two decades. During this period the paper industry in Sweden has expanded considerably with an increased demand for all types of paper chemicals. Starch improves the bulk sizing in paper, increases retention at the wet end of paper machines and it gives a good surface strength to coated paper. More than 100 000 tons per year of starch is utilised in the paper industry. The major part is produced by Lyckeby Stärkelsen Industrial Starches and AB Stadex (owned by AVEBE,

Holland). National Starch & Chemical AB (owned by ICI, UK) is another manufacturer of starch derivatives and adhesives for industrial and building applications.

Fine chemicals

Nordic Synthesis AB in Karlskoga, a subsidiary of Cambrex Corp., USA specialises in complex multistep synthesis and has a long track record in supplying active pharmaceutical ingredients and intermediates to the pharmaceutical and speciality chemicals industry. The company has special expertise in nitration, nitric acid oxidation, acid chlorination, catalytic hydrogenation and various other technologies. Nordic Syntheses possesses eight full scale and four pilot plants including multipurpose capabilities.

Other organic chemicals and thermosetting plastics

Akzo Nobel Base Chemicals AB in Skoghall has a large production capacity of monochloroacetic acid (MCA, 40 000 tons per year) and sodium monochloroacetate (SMCA, 6 000 tons per year) as base for the production of CMC. MCA and SMCA are of interest particularly to the pharmaceutical industry. The process for the production of MCA has been developed within the company.

Akzo Nobel Surface Chemistry is producing a wide range of organic chemical specialities (fatty amines, etc), for flotation, viscose production, enhanced oil recovery, anticaking and surfactants. Their capacity for surfactants production is approximately 60 000 tons per year. A sugar based type of surfactants has recently been introduced, namely alkylpolyglukoside (APG) with a production capacity in Stenungsund of 5 000 tons per year. Akzo Nobel Surface Chemistry in Sundsvall and Norac Andos in Köpmanholmen are producers of organic peroxides.

BIM Kemi AB manufactures specialty chemicals, e.g. surface active agents, organic dispersants and micro dispersions, mainly for the pulp and paper industry. Akzo Nobel Rexolin AB at plants in Helsingborg and Kvarntorp are producing organic complexing agents (NTA, EDTA, DTPA, HEDTA) used in the new non-chlorine bleaching systems and micro nutrients. A new plant for micro nutrients is under construction in Kvarntorp. Betz Dearborn, BIM Kemi, Dow Sverige, Eka Chemicals, Hercules, Scanlatex and some other companies produce organic chemicals and latex used in paper production as wet end or coating chemicals. In 1997 Eka Chemicals went into full production (7 000 tons per year) in Trollhättan with a solvent-free method for making alkylethenedimer (AKD) wax, a neutral sizing agent for papermaking.

Sweden to a great extent relies on imports to satisfy the demand of organic chemicals and intermediates. There is no domestic production of methanol, toluene, benzene or xylene. Large quantities of methanol are imported in contrast to the other three organics. Perstorp AB and Casco Products AB use imported methanol for local production of formaldehyde (over 200 000 tons per year). Perstorp AB applies its own technology for the manufacture of formaldehyde, a process being used by many foreign producers, licensees of the Perstorp technology. Perstorp produces the catalyst for the formaldehyde process. Formic acid and sodium formate are other products from Perstorp. In addition, Perstorp AB and Casco Products produce thermosetting plastics and resins by reacting the formaldehyde with phenol, melamine or urea. Casco Products has developed expandable microspheres (‘Expancel’) with a wide range of applications.

Paints and intermediates for paints

The Swedish production of paints and varnishes is stimulated by the high annual consumption of these products. The largest companies for decorative coatings are Akzo Nobel Decorative Coatings AB, Alcro Beckers AB and Flügger AB, and for industrial coatings Akzo Nobel Industrial Coatings, Becker Industrifärg AB and International Färg AB. Inks are produced by Casco Inks in Trelleborg, Markpoint System in Göteborg and by Rosinco in Filipstad.

Raw materials and intermediates for paints are largely manufactured in Sweden. Perstorp AB produces polyols, mainly trimethylolpropane (TMP), pentaerythritol and neopentyl glycol, used in the production of bonding agents for paints. Perstorp also produces special polyols such as 'Di-TMP' (2 500 tons per year). Neste Oxo AB is a joint venture partner to Perstorp AB in the neopentyl glycol production. Arizona Chemical, DSM Scandinavia in Landskrona and McWhorter Technologies in Mölndal manufacture alkyd resins. McWhorter Technologies AB also produces polyester resins, amino resins, vinyl acetate and acrylic emulsions. DSM Scandinavia manufactures polyester resins and polymeric plasticisers. Hoechst-Perstorp is another producer of vinyl acetate and acrylic emulsions. Rohm and Haas Nordiska AB in Landskrona, a producer of acrylic emulsions, has a production capacity of 90 000 tons per year. Akzo Nobel Surface Chemistry is a producer of thickeners (EHEC) for paints.

Pesticides[2]

Tables 1G and 1H show quantities of agricultural and other pesticides sold in 1999 by use category and hazard class or restriction class (see Section 2.2), respectively. The ten most used pesticides in 1998 are shown in Table 1I. Table 1J shows the reduction in quantities of agricultural pesticides used since 1981. The use of non-agricultural pesticides (and some other biocidal products) are shown in Table 1K.

Hazardous waste

The approximate annual amounts of collected, treated or stored quantities of hazardous chemical waste are shown in Table 1L. The export and import of waste chemicals was 26 000 tons and 88 000 tons, respectively, in 1994.

[2] In Sweden "pesticides" (Sw. bekämpningsmedel) are taken to include agricultural as well as non-agricultural pest control agents

Table 1A. Chemical production and trade 1994/95

Chemical Type	**Production[3], tons/year and value**	**Import, tons/year and value**	**Export, tons/year and value**
Pesticides for agricultural, public health and consumer use, formulated products	6 000 tons[1] SEK 210 million	14 000 tons[1] SEK 640 million	4 000 tons[1] SEK 210 million
Fertilisers	610 000 tons[2] SEK 890 million	899 000 tons[2] SEK 1 000 million	640 000 tons[2] SEK 800 million
Petroleum Products (excluding crude oil)	26 million tons[2] SEK 22 000 million	12 million tons[2] SEK 9 600 million	11 million tons[2] SEK 10 000 million
Industrial (used in manufacturing/processing facilities, except pesticides)	14 million tons[1] SEK 11 000 million	7.1 million tons[1]	2.5 million tons[1]
Consumer Chemicals	2.8 million tons[1]	530 000 tons[1]	32 000 tons[1]
Total	44 million tons	20 million tons	14 million tons

[1] Source: The National Chemicals Inspectorate's Chemical Products Register
[2] Source: Statistics Sweden
[3] Including formulation and packaging

Table 1B. Sales value and number of employees in the chemical industry 1997, SEK million

	Sales 1997, SEK million	**Employees 1997**
Pharmaceuticals	33 114	16 013
Plastics (including basic plastics)	13 981	5 418
Chemical elements and compounds (including fertilisers)	13 987	7 643
Paints	6 035	3 468
Soap and detergents	2 566	1 752
Miscellaneous (including size Explosives)	5 139	3 283
Total	74 822	37 577

Table 1C. Sales value and number of employees in refinery, rubber and plastic industries 1997, SEK million

	Sales 1997, SEK million	**Employees 1997**
Chemical industry (SNI24)	74 822	37 577
Refinery	6 639	2 688
Rubber	7 306	6 509
Plastics (including basic plastics)	20 343	17 006
Total chemical industries including refinery, rubber and plastic	109 110	63 780

Table 1D. Use of major chemicals by total quantity and number of products, respectively, 1997 [1]

Major Chemicals in Decreasing Order by Quantity Used	**Major Chemicals in Decreasing Order by Number of Products Used**
Petroleum (Crude oil)	Water
Diesel oil	Xylene
Gasoline	Titanium oxide
Petroleum residues	5-Chloro-2-methyl-3-isothiazolone
Petroleum distillates, hydrotreated	Isopropanol
Petroleum residues, thermal cracked	Butylacetate
Nitrogen	Ethanol
Portland cement	2-Methyl-3isothiazolone
Water	Solvent naphta, medium aliphatic
Carbon dioxide	Silica
Gas oils, hydrotreated	Talc
Fuel oils, residual	Formaldehyde
Oxygen	Solvent naphta, light aromatic
Solvent naphta, light aliphatic	Carbon black
Asphalt (Bitumen)	Sodium hydroxide
Carbon monoxide	Ethene, homopolymer
Kerosene	Propylene glycol
Methane	Petroleum distillates, solvent refined heavy paraffinic
Ammonium nitrate	Toluene
Sodium chloride	Calcium carbonate

[1] Source: Hazardous chemicals, Statistics Sweden, Mi 45 SM 9901, November 1999

Table 1E. Chemical products classified as dangerous to health, number of products and quantities used 1997, 1000 tons

Danger category	**Total number of products available**	**Number of products available to non-occupational consumers**	**Total quantity of products available**	**Quantity of products available to non-occupational consumers**
Very toxic	150	1	15	0
Toxic	1 630	109	39 200	7 470
Corrosive	3 720	271	2 470	148
Irritating	7 320	749	3870	2 660
Harmful	10 400	1 600	15 800	5 640
Moderately harmful	6 010	1 440	2 660	789
All classified	29 230	4 170 (14 %)	64 015	16 707 (26%)

Table 1F. Chemical products classified as dangerous to the environment or containing substances classified as dangerous to the environment, number of products and quantities used 1997, 1000 tons

Classification category	Total number of products available	Number of products available to non-occupational consumers	Total quantity of products available	Quantity of products available to non-occupational consumers
Chemical products classified as dangerous to the environment based on official classification of components *	275	7	32	0.2
Chemical products containing substances officially classified as dangerous to the environment *	5 069	559	1 928	128
Chemical products containing substances classified as dangerous to the environment by the manufacturer	3 936	635	9 876	6 384
Total	9 280	1 201 (13 %)	11 836	6 512 (55 %)

* See the National Chemicals Inspectorate's regulations on classification and labelling of chemical products (KIFS 1994:12), www.kemi.se/default_eng.cfm?page=klass_mark/klasshem_eng.htm

Table 1G. Quantities of pesticides sold in 1999 by hazard class and use category , tons of active substance *

Use Category	Toxic Products and Very Toxic Products	Harmful Products	Moderately Harmful Products	Total
Agriculture, forestry and horticulture	109	1 229	423	1 762
Industry	5 228	748	3.9	5 980
Households	0	261	32	293
Total	5 337	2 239	458	8 035

Table 1H.Quantities of pesticides sold in 1999 by use category and restriction class, tons of active substance

Use Category	Restriction Class 1	Restriction Class 2	Restriction Class 3	Total
Agriculture, forestry and horticulture	155	1 598	22	1 774
Industry	5 180	793	6.2	5 980
Households	0	0	299	299
Total	5 335	2 391	327	8 053

Table 1J. Ten most used pesticides 1998

Pesticide	Type of pesticide	Quantity sold, tons
Creosote	Wood preservative	4 600
Chromium trioxide	Wood preservative	470
Glyphosate	Herbicide	470
Arsenic pentoxide	Wood preservative	310
MCPA	Herbicide	230
Cupric oxide	Wood preservative	190
Copper hydroxide carbonate	Wood preservative	170
Metamitron	Herbicide	110
Glutaraldehyde	Slimicide	110
Isoproturon	Herbicide	93

Source: Sold Quantities of Pesticides 1998, The National Chemicals Inspectorate, 1999

Table 1K. Reduction in quantities of pesticides sold 1986-1998 by use category, tons of active substance [1]

Use category	Annual average 1981-1985	Annual average 1991-1995	1998
Agriculture, forestry and horticulture	4 561	1 690	1 723
Percent of 1981-1985 annual average	100	37	38
Industry [2]	8 153	6 947	6 380
Households [2]	832	315	297
Total	13 546	8 952	8 400

[1] Source: Quantities of Pesticides Sold in 1998, National Chemicals Inspectorate, 1999 (in Swedish)
[2] Use sector not covered by reduction programmes

Table 1L. Use of non-agricultural pesticides and some other biocidal products 1997

Main Groups of Biocides [1]	**Product Types**	**Quantity Used, tons of active substance** [2 3]
1. Disinfectants and General Biocidal Products	1. Human hygiene biocidal products	
	2. Private area and public health area disinfectants and other biocidal products	
	3. Veterinary hygiene biocidal products	
	4. Food and feed area disinfectants	1 700
	5. Drinking water disinfectants	
	Subtotal	5 900
2. Preservatives	6. In-can preservatives	
	7. Film preservatives	
	8. Wood preservatives *	6 000
	9. Fibre, leather, rubber and polymerised materials preservatives	
	10. Masonry preservatives	
	11. Preservatives for liquid-cooling and processing systems	
	12. Slimicides *	197
	13. Metalworking-fluid preservatives	120
	Subtotal	13 700
3. Pest Control Products	14. Rodenticides *	< 1
	15. Avicides	
	16. Molluscicides	
	17. Piscicides	

Main Groups of Biocides [1]	Product Types	Quantity Used, tons of active substance [2 3]
	18. Insecticides, acaricides and products to control other arthropods	
	19. Repellents and attractants *	3
	Subtotal	240
4. Other Biocidal Products	20. Preservatives for food or feed stocks	36 400
	21. Antifouling products *	61
	22. Embalming and taxidermist fluids	
	23. Products for control of other vertebrates	
	Subtotal	?

[1] See Directive 98/8 of the European Parliament and European Council concerning the placing of biocidal products on the market, 16 February 1998
[2] Source: Hazardous Chemicals, Statistiska meddelanden Mi 45 SM 9901, Statistics Sweden, November 1999
[3] Source: National Chemicals Inspectorate, May 2000
* National approval procedure in place in 1997

Table 1M. Approximate annual chemical waste generation and collection

Type of Chemical Waste	Amount Collected by Municipalities 1994[1], tons	Total Amount Collected 1990, tons[2]	Amount Treated or Stored by SAKAB 1995, tons[3]	Amount Received by SAKAB 1999, tons [7]
Oil wastes	126 000	140 000[4]	18 000	17 000
Solvent wastes	9 500	16 600	15 000	21 000
Paints and coatings	9 800	12 200	8 000	11 400
Adhesives	300	230	300	370
Acid or alkaline wastes	4 400	7 600	3 700	5 000
Waste containing cadmium	400	860[5]	1	5
Waste containing mercury	300	50	100[6]	1 200
Waste containing other metals	16 000	135 000	17 000	72 000
Waste containing cyanides	200	610	200	320
Waste containing PCBs	5 400	12 100	2 000	1 100
Pesticide wastes	400	220	200	125
Laboratory wastes	1 200	780	80	77
Other chemical wastes	91 000	1 800	2 500	6 700
Total	265 000	328 000	66 800	136 000

[1] Source: Statistics Sweden
[2] Source: Hazardous Waste - Responsibilities and Guidelines (SOU 1992:45) [in Swedish]
[3] Source: SAKAB 1996
[4] Largely used as fuel in cement kilns etc.
[5] Mostly NiCd batteries
[6] Altogether 700 tons stored at SAKAB
[7] Source: SAKAB, January 2000

2. National Legislation [3]

2.1 Environmental and Chemicals Control Legislation

Old and new legislation

The Environmental Code (SFS 1998:808) entered into force on 1 January 1999. Earlier rules contained within 15 acts [4] have now been amalgamated in the Environmental Code.
Despite the fact that the Environmental Code contains 33 chapters comprising almost 500 sections, only the fundamental environmental rules that are included in the Code itself. More detailed provisions have been lain down in government ordinances.

The objectives and scope of the Environmental Code

The Environmental Code is to be applied so that the health of humans and the environment is protected against damage and nuisance, irrespective of whether these are caused by pollution or other influences, valuable natural and cultural environments are protected and conserved, biological diversity is preserved, land, water and the physical environment generally are used so that, from an ecological, social, cultural and socio-economic viewpoint, the long-term good management of resources is assured, and reuse and recycling together with other management of material, raw materials and energy are promoted so that an ecological cycle ('eco-cycle') is attained.

The fundamental rules of the Environmental Code apply, in principle, to all human activity that may harm the environment. The general rules of consideration are the most central provisions. These indicate that operations must be conducted and measures taken so that harm to the health of humans and the environment is averted. Simultaneously, the efficient management of land, water and other resources is promoted. Unless otherwise provided, the rules of the Environmental Code apply to all operations and measures that affect the environment. It is immaterial whether the operation or measure takes place as part of a commercial operation or if it is conducted by a private individual. Thus, the Environmental Code applies to everything from major projects, such as building and operating

[3] Sweden is a member of the European Union since 1 January, 1995

[4] The old acts were: the Natural Resources Act; the Nature Conservancy Act; the Flora and Fauna Act; the Environmental Protection Act; the Health Protection Act; the Water Act; the Agricultural Land Management Act; the Genetically Modified Organisms Act, the Chemical Products Act; the Biological Pesticides Act; the Pesticides (Spreading over Forest Land) Act; the Fuels (Sulphur Content) Act; the Public Cleansing Act; the Dumping of Waste in Water (Prohibition) Act; and the Environmental Damage Act.

hydroelectricity plants or motorways, to small individual measures, such as washing a car with detergents or composting household waste.

Precautionary measures

The fundamental rule for consideration in the Environmental Code means that everybody who is to take a measure must perform those protective measures, observe the limitations and take the precautionary measures that are required in order that the measure will not harm health or the environment. The rule is a natural consequence of the Polluter Pays Principle prepared by the OECD in the early 1970s. The obligation to take precautionary measures is also closely linked to the internationally recognised precautionary principle. According to this principle, precautionary measures must be taken as soon as there is reason to assume that a measure may injure human health or the environment. The person conducting the operation cannot excuse himself by the absence of complete scientific evidence that harm arise.

Examples of appropriate precautionary measures include: the minimisation of emissions by the use of a particular filter or careful purification of waste water; that garden waste is not burned during unfavourable wind conditions; the erection of noise barriers; that chemicals are dealt with on a hard surface so that spills do not penetrate the ground; that dams are built in accordance with safety requirements and without constituting migration obstacles to fish; that the number of animals in agriculture is limited; or that a person arranging outdoor recreation for others informs the participants about the meaning of the right of common access (Right of Public Access - Sw. Allemansrätten). When an activity requires a permit, it will be appropriate to impose conditions under the section.

Best available technology

Commercial operations must apply the best possible technology to avoid damage. The technology must, from the technical and financial viewpoint, be industrially feasible to apply within the trade in question. This means that it must be available and not only exist at an experimental stage. However, the technology does not have to be located within Sweden. In the case of existing activities, a certain transitional period is sometimes required for the introduction of equipment corresponding to what is considered to represent the best possible technology.

Knowledge

It is reasonable that a party intending to commence an operation first acquires the knowledge required to determine the environmental effects that may arise. There is a special rule concerning this. There is, of course, a difference in the requirements that may be imposed concerning a private individual's knowledge of the effect of various everyday measures on the environment and the requirements that may be imposed on someone responsible for operating industrial activities when choosing, for example, various chemical products required for the activity. However, it is always the possible effect of a measure, which determines the required

knowledge and not the person taking the measure.

The Product Choice Principle

Everybody who is to take a measure must avoid using or selling chemical products or bio-technical organisms that can harm human health or the environment, if these may be replaced with such products or organisms that may be assumed to be less hazardous. Corresponding requirements apply as regards goods containing or which have been dealt with a chemical product or bio-technical organism. The provisions express the product choice principle, or the substitution principle as it was previously known.

Chemical product means a chemical substance or preparation of chemical substances. Bio-technical organism means a product that has been specially produced to function as a pesticide or for some other technological purpose or which completely or partially consists of or contains living micro-organisms, nematodes, insects or spiders.

An assessment must be made in every individual case. Prohibition of the use or sales can never be imposed generally for a product, organism or goods. Instead, general prohibitions of chemical products that are so hazardous that they cannot be permitted under any circumstances, and also prohibitions of such products where equally effective substitutes involve a manifest advantage from the environmental viewpoint, may be imposed under the provisions of the chapter of the Environmental Code dealing with chemical products.

It should be observed that the product choice principle does not only apply to commercial sale or use. The rule also applies to a private individual who takes a measure. When a car owner washes his/her car and is to purchase detergents for this at a garage, he/she must choose the substance that is the least hazardous to the environment as possible yet nevertheless cleans the car. A correct choice presupposes that the goods are labelled in such a manner that the consumer obtains correct information about the properties of the product.

Producer responsibility

Regulations about producer responsibility may be issued under the Environmental Code. Producer responsibility means that the producer must ensure that the waste is collected, transported away, recycled, reused or disposed of in such a manner as may be necessary from the viewpoint of health and environmentally acceptable waste handling. Such regulations may be issued as regards waste from the goods and packages that producers manufacture, import or sell and the waste from the operations they conduct. The expression 'producer', in this connection, also comprises a party who imports or sells goods or packages.

To date, the Government has made rules on producer responsibility in four areas, namely recycled paper, tyres, packages and automobiles.

Chemical products and other property that have been the subject of offences may be declared forfeited, unless this is manifestly unreasonable. This also applies to the value of property or

the gains from such offences.

Environmental quality norms [5]

An important new provision in the Environmental Code is the possibility to introduce environmental quality norms. According to these rules, the Government may issue regulations for certain geographical areas or for the whole of Sweden on the quality for land, water, air or the environment generally, if this is necessary for the long-term protection of human health or the environment or to alleviate damage. Such regulations are referred to as environmental quality norms. Norms that Sweden is liable to introduce under EC rules may also be issued by authorities other than the Government.

Environmental quality norms will specify the levels of pollution and level of disturbance that humans may be exposed to without risk of nuisance of significance or which the environment or nature may be subjected to without danger of manifest nuisance. The levels of environmental quality norms may not be contravened after a certain stated time. The norms must specify, for example, the maximum or minimum amounts of chemicals in land, water or air or the maximum levels of noise. Environmental quality norms may also state the highest or lowest water levels or flows in a watercourse or the highest or lowest amount of water in an organism to serve as a guide for assessing the condition prevailing in the environment.

The Environmental Protection Agency has proposed that environmental quality norms are introduced for sulphur dioxide, nitrogen dioxide and lead in outdoor air. The Agency will continue its work and propose additional norms. It is significant to the work with producing environmental quality norms that Sweden, as a member of the EU, is obliged to have certain norms.

Public and local authorities must ensure that environmental quality norms are attained when they consider permits and similar approvals. This applies both to determinations under the Environmental Code and to other acts, for example, the Planning and Building Act, Roads Act and Nuclear Technology Act. A permit may not be issued for an operation that contributes to an environmental quality norm being contravened. Furthermore, a permit may be reconsidered if the operation contributes to a material extent to an environmental quality norm being contravened.

Even when public and local authorities exercise supervision or issue regulations, environmental quality norms must be satisfied. The norms must also be observed when projecting and planning. Municipal plans under the Planning and Building Act may not be issued in contravention of the norms. A programme of measures must be prepared if necessary to attain the environmental quality norm or if a programme of measures is called for under EC law. The programme of measures is prepared by the Government of another authority or municipality.

The programme of measures must state the measures that are to be taken to satisfy the

[5] Ordinance (1998:897) on Environmental Quality Norms also applies

environmental quality norms, which authorities and municipalities must ensure that these measures are taken and when the measures are to be implemented.

Chemical products and bio-technical organisms [6]

Even as regards dealing with other measures with chemical products and bio-technical organisms, the general rules on consideration in Chapter 2 of the Environmental Code apply. The requirements for knowledge and product choice principle are of particular importance. Furthermore, Chapter 14 contains special rules about chemical products and bio-technical organisms. In all material respects, the regulation of bio-technical organisms is new.

Chemical product means a chemical substance and preparations of chemical substances. The provisions on chemical products shall also be applicable to goods containing or which have been treated with chemical products. Examples of such goods are impregnated timber, goods that contain asbestos and goods containing mercury.

Bio-technical organism means a product that has been specially produced to act as a pesticide or for some other technical purpose, for example, as a detergent, and which completely or partially consists of or contains living micro-organisms, nematodes (roundworms), insects or spiders. In this connection, micro-organism also means virus.

Environmental and health investigation

A party who manufactures or imports chemical products or bio-technical organisms shall ensure that there is a satisfactory environmental and health investigation. The obligation regarding investigation applies irrespective of whether there are any concrete fears. It applies continually and therefore does not end when a product or organism has been introduced onto the market.

Product information

A party who commercially manufactures, imports or transfers a chemical product or bio-technical organism must, by labelling, provide the information necessary to protect human health or the environment. Alternatively, the product information may be effected in another manner than by labelling, for example, by an information sheet enclosed with the chemical product or bio-technical organism.

A party who commercially handles, imports or exports a chemical product or bio-technical organism shall also provide information about the product and organism to the Chemicals Inspectorate.

[6] Ordinance (1998:941) on Chemical Products and Bio-technical Organisms also applies

Chemical Products Register

Chemical products that are commercially manufactured in Sweden or imported to Sweden must be registered in a products register (see also Appendix 3). A corresponding register may be prepared for bio-technical organisms.

Advance notification, permit and approval

The requirement of advance notification may be introduced for the manufacture and import of chemical products and bio-technical organisms that have not previously been used in Sweden. Furthermore, a permit may be required for the import of especially dangerous chemical products and bio-technical organisms from countries that are not members of the European Union and for the commercial transfer and other handling of particularly dangerous products and organisms.

Special requirements apply to chemical or biological pesticides. These may not be imported from countries outside the EU, released onto the market or be used without prior approval. Chemical or biological pesticides that have not been approved or which are not subject to an exemption from the requirement of approval may be used as pesticides only if it is obvious that their use does not involve a risk to human health or the environment.

Fuel [7]

In order to reduce the emission into the atmosphere of substances that can cause nuisance to human health or the environment, regulations may be made on the quality and handling of fuel. Petrol intended for motor vehicle power or heating is split into environmental classifications.

Prohibition [8]

If it is of particular importance from the health or environmental viewpoint, a chemical product or bio-technical organism may be prohibited generally. This may be appropriate in the case of, for example, carcinogenic products. It may also be relevant in the case of products whose feared injurious effects in the individual case, though not of a serious kind, can through widespread use result in injurious effects, such as for example cosmetics, hygienic products and pesticides.

[7] Ordinance (1985:838) on Motor Fuel also applies

[8] Ordinance (1998:944) on Prohibition in Connection with Handling, Import and Export of Certain Chemical Products also applies

Hazardous waste and producer responsibility [9]

Rules about waste and producer responsibility are contained in Chapter 15 of the Environmental Code. This Chapter also contains provisions about dumping and litter. Obsolete and other pesticide waste problems are scarce in Sweden due to, inter alia, the possibility to gradually phase out chemical products. WM SAKAB, a privately owned dedicated waste processing plant with land fill, wet-chemical and high-temperature incinerator facilities, is available in central Sweden.

Waste means every object, material or substance included in a waste category and which the holder disposes of or intends to or is obliged to dispose of. An appendix to an ordinance will list the categories of waste. The appendix will reflect the corresponding appendix to the EU Waste Directive.

Environmental penalty charges [10]

An environmental penalty charge must be paid by a business operator who in the conduct of commercial operations neglects regulations issued under the Environmental Code, violates a permit or condition or commences an activity that requires a permit or is subject to a duty to give notice without such permit or notice. The charge shall be imposed even if the violation has not occurred intentionally or by carelessness. Thus it is founded on strict liability. Furthermore, it is of no relevance whether the business operator had any economic gain from the violation or if the violation involved any nuisance in the particular case.

The environmental penalty charges will be imposed for various kinds of violations in respect of which the Government, by regulations, has determined fees. Thus, the Government will by an ordinance compile a list of various violations with information on the charge for the respective violation. The charge may be minimum SEK 5 000 and maximum SEK 1 000 000. If rectification is not effected, the supervisory authority may make a new decision for an environmental sanction charge for a subsequent period. However, the charge does not prevent the imposition of a penalty for the criminal activity.

The supervisory authority decides on the environmental sanction charge. The decision may be appealed against to the environmental court. Even if the decision is appealed against it may be enforced.

[9] Ordinance (1996:971) on Hazardous Waste also applies
[10] Ordinance (1998:950) on Environmental Sanction Charges also applies

2.2 Pesticide Regulations

Legal basis

The legal basis for Swedish pesticide control is to be found in five categories of legal documents:

* the European Community legislation [11]
* the Environmental Code and other acts promulgated by the Swedish Parliament
* ordinances promulgated by the Swedish Government [12]
* regulations issued by competent Swedish authorities [13]
* general recommendations issued by competent authorities.

The Environmental Code is a framework statute covering inter alia the control of pesticides. It contains several basic provisions governing the manufacture, import, export, sale and other handling of chemical products. The Code is accompanied by an Ordinance on pesticides. The purpose of the legislation is to prevent injury to human health and the environment being caused by the inherent properties of pesticides. The framework structure of the Code means that the Government or a designated government agency (such as the National Chemicals Inspectorate) can promulgate ordinances and regulations, respectively, in order to implement the provisions of the Code (and Ordinance).

Supplier's responsibilities

Anyone handling or importing a pesticide (or other chemical product) must take such steps and observe such precautions as are necessary to prevent or minimise harm to human beings or the environment. This includes avoiding a products for which a less hazardous substitute is available. The Environmental Code and accompanying legislation lay the main responsibilities on the manufacturer or importer to fulfil the objectives with regard to safe and environmentally sound use. This task is achieved inter alia through:

* Mandatory investigations by the manufacturer of all pesticide products with respect to their health and environmental effects,
* Mandatory provision by the manufacturer of sufficient product information (labels, safety data sheets) to the end user, and
* Mandatory substitution of hazardous products with less hazardous products.

Registration procedure

Pesticides may not be offered for sale, transferred or used without being approved by the

[11] See A Very Brief Guide to European Directives and Regulations Relevant to Pesticides, J A R Bates, Pesticide Outlook, August 1994, p18-22

[12] e.g. Ordinance on Pesticides (SFS 1998:947), and Ordinance on Biocidal Products (SFS 2000:338)

[13] e.g. The National Chemicals Inspectorate's Regulations on Chemical Products and Bio-technical Organisms (KIFS 1998:8)

National Chemicals Inspectorate. A pesticide may be approved only if it is acceptable from the standpoints of human health and environmental protection. An approval is accompanied by a decision on proper labelling and other product information, proper protective equipment and other special conditions for the prevention of injury and damage.

Sales and use permits

During the approval procedure, potential environmental and health effects of the pesticide are assessed in consideration of its intended use. Based on such an evaluation, the pesticide is assigned to one of the following restriction classes:

Class 1: Pesticides that may only be used professionally by someone holding a special permit;
Class 2: Pesticides that may only be used professionally;
Class 3: Pesticides that may be used by anyone.

In addition, a permit is required for professional transfer and other than professional handling of products classified as extremely dangerous or very dangerous.

The quantity of pesticides sold in 1999 by restriction class are shown in Table 1E.

Labelling requirements

It is the obligation of the Swedish manufacturer, the importer or other supplier of a pesticide to ensure that the product is labelled in Swedish and in accordance with the regulations. The label must include area of approved application; the phrase ‘All other use is prohibited; the word 'Pesticide'; contents specification; instructions for use needed for the protection of health and the environment; name of the pesticide(active ingredient/ingredients); instructions for final disposal of the product and the package in a safe manner; the name and concentration of the active ingredient(s); name and address of the permit-holder; competence (restriction) class; for pesticide products in Class 1 the text ‘ Only for professional use with special permit’; for pesticide products in Class 2 the text: Only for professional use’; shelf life if less than two years; registration number; approved area(s) of application and a text in Swedish stating that all other uses are prohibited; risk information including danger symbol/symbols; safety precautionary measures; safety advice; batch number; and net weight or net volume.

Safety Data Sheets

Manufacturers, importers and other suppliers who place a pesticide on the market for professional use (restriction classes 1 and 2), shall provide information on the properties of the product from the viewpoints of risk and safety. The information shall be provided free of charge to the professional user in the form of a safety data sheet. The safety data sheet must contain the following information: identification of the product and of the company; composition, information on ingredients, classification; hazard identification; first-aid measures; fire-fighting measures; accidental release measures; handling and storage; exposure

control and personal protection; physical and chemical properties; stability and reactivity; toxicological information; ecological information; disposal considerations; transport information; and regulatory information.

Training requirements

Pesticides assigned to Class 1 and those pesticides in Class 2 used mainly in agriculture, forestry, horticulture or as wood preservatives may be used only by persons meeting certain competence requirements, and, who in some cases, have attained a certain age.

Spreading pesticides

Chemical or biological pesticides must be spread in such a manner that human health is not harmed or humans caused other nuisance and so that the environmental impact is as little as possible. Pesticides may not be spread from aircraft. Nor may pesticides be spread over forestland to combat brushwood.

Banned or severely restricted pesticides

The National Chemicals Inspectorate has issued a list of pesticides (active substances) which have been banned or severely restricted for health or environmental reasons or for which the manufacturer has voluntarily withdrawn a product from the Swedish market.

A number of national and European community legislation contain lists of approved, restricted or banned pesticides (see Box 1).

To avoid stockpiling and other waste management problems of a pesticide following a decision to discontinue the registration, the manufacturer or importer is usually allowed to keep on marketing the product for a year. After that period, the pesticide may be used yet another year.

Pesticide fees

The National Chemical Inspectorate's pesticide related activities are funded by fees paid by the pesticide industry. The registration fee is USD 1 170 (SEK 10 000) per product plus USD 3 530 (SEK 30 000) for each new active substance. The prolongation fee (every five years) is USD 700 (SEK 6 000). The annual fee is 2.6 % of the product's sales value the previous year with a minimum fee of USD 235 (SEK 2 000) and a maximum fee of USD 23 500 (SEK 200 000). The application fee for an EU-new active substance (for inclusion on Appendix 1 of Directive 91/414/EEC) is USD 350 000 (SEK 3 000 000).

Box 1. Approved, restricted and banned pesticides (active substances)

- Pesticides approved in Sweden
  (Annual list issued by the National Chemicals Inspectorate, in Swedish with a guide to English readers) [1]
- Pesticides banned in Sweden [2]
  (KIFS 1998:8, Appendix 5)
- Pesticides severely restricted in Sweden [2]
  (KIFS 1998:8, Appendix 5)
- Substances which may not be included as active substances in approved plant protection products in the European Union [2]
  (Directive 79/117/EEC, Chapter 5, §2)
- Substances withdrawn from market in the European Union [2]
  (Directive 91/414/EEC)
- Substances included in Annex 1 (approved for inclusion as active ingredients in plant protection products in the European Union) [2]
  (Directive 91/414/EEC)
- Substances banned or severely restricted in the European Union due to their effects on human health or the environment
  (Regulation 2455/92, Annex 1)
- Substances included in the international Prior Informed Consent Procedure
  (Regulation 2455/92, Annex 2)

[1] Kemikalieinspektionens förteckning över bekämpningsmedel m.m., September 1999
[2] see also www.kemi.se/default_eng.cfm?page=lagar_eng/default.htm

Sales statistics and feedback

The Inspectorate has a database (Pesticides Register) covering all approved pesticide products, their composition, and quantities sold the previous year. An annual list of approved pesticide products is issued by the Inspectorate as well as annual sales statistics. Swedish manufacturers and agents to foreign manufacturers who have had a pesticide product filed in the Pesticides Registry on some occasion during a calendar year must provide information to the National Chemicals Inspectorate concerning the quantity of the product transferred, and estimated distribution of the quantity between agriculture, forestry, commercial fruit growing

and gardening, industry, and household consumption.

Tables 1F shows sales statistics for major pesticides. The use of non-agricultural pesticides (and some other groups of biocidal products) is shown in Table 1G.

The Swedish Poisons Centre collects and publishes statistics on incidents and accidents concerning pesticides (and other chemicals).

Enforcement

A number of government agencies make sure that the manufacturers and importers of pesticides take their responsibility under the pesticides control legislation . The National Chemicals Inspectorate (a general-directorate under Ministry of Environment) is responsible for the entire approval procedure covering both health and environmental aspects and agricultural and non-agricultural pesticides (plant protection products and biocides). The Inspectorate has a right to issue regulations and general recommendations and restrict or prohibit the use of a pesticide.

Other government agencies supervise occupational use and environmental effects of pesticides, respectively. The National Food Administration (a general-directorate under Ministry of Agriculture) establishes maximum pesticide residue limits and monitors imported and domestically produced foods, and drinking water. Results are published the year after the monitoring took place. The Swedish Environmental Protection is the competent authority for hazardous waste management. The Swedish Board of Agriculture (in co-operation with the County Administrations) is responsible for training of spray operators.

Residue monitoring

Pesticide residues in fresh and preserved fruits and vegetables (imported as well as domestic), and occasionally drinking water are monitored by the National Food Administration. Results are published annually [14]. Residues in water have been monitored by the National Food Administration[15] and others [16].

2.3 Other Legislation

In addition to the Environmental Code, there are several product-related or activity-related national acts and ordinances. The chemicals control legislation of the European Community has been implemented into the national chemicals control system with only a few and basically

[14] Pesticide Residues in Food of Plant Origin 1998, Report 10/99, The National Food Administration, Uppsala, 1998; www.slv.se/HeadMenu/livsmedelsverket.asp

[15] Dricksvatten – en stor undersökning av bekämpningsmedel, D Rosling, B Erlandsson, T Pihlström, B-G Ericsson, Vår Föda No. 1, 1998 (in Swedish only)

[16] Pesticides in Surface Waters, A Review of Pesticide Residues in Surface Waters in Nordic Countries, Germany and the Netherlands, and Problems Related to Pesticide Contamination, Council of Europe, Strasbourg, 1995

temporary exceptions.

The use of chemicals is also regulated by the Work Environment Act, administered by the National Board of Occupational Safety and Health. Government agencies such as this one have the power to establish binding regulations under the law.

Several agencies use standard setting procedures, for example the Food Administration, the National Board of Occupational Safety and Health and others. A report (in Swedish) has recently been issued by the Swedish Toxicological Council on how and why standards are set.

The Work Environment Act (1977:1160) and the Work Environment Ordinance (1977:1166) lay down provisions to ensure a working environment which will not expose employees to ill health or accidents and which is satisfactory having regard to the nature of work and social and technical developments in the community. They also promote partnership between employers and employees in pursuit of a good working environment.

Additional ordinances falling under the Working Environment Act are:

- Ordinance (AFS 1981:23) on Asbestos
- Ordinance (AFS 1980:11) on Measures Against Air Contaminants
- Ordinance (AFS 1984:5) on Occupational Exposure Limit Values

Several areas where problems related to chemicals may occur are regulated separately, e.g.:

- The Food Act (1971:511) and the Food Ordinance (1971:807) which apply to the offering for sale, selling and serving or other delivery of food for consumption.

- The Act (1985:295) on Feeding-stuffs

- Regulations are also issued governing the import of foodstuffs, permitted food additives, residues of xenobiotics and on drinking water.

- The Medicinal Products Act (1992:859) and Medicinal Products Ordinance (1992:1752) apply to pharmaceuticals. The Environmental Code, however, is applicable to chemical products that are marketed as hygienic or cosmetic products.

- The Act (1988:868) on Flammable and Explosive Products

- Ordinance (1988:1145) on Flammable and Explosive Products

- The Act (1982:821) on Transportation of Dangerous Goods.

- The Ordinance (1982:923) on Transportation of Dangerous Goods.

The Secrecy Act (1980:100) contains provisions on secrecy applicable to inter alia supervisory agencies under the Ordinance on Chemical Products and Bio-technical Organisms. Secrecy shall apply to information about the business or management conditions, inventions or research results

of a private person, if it can be assumed that the person concerned should suffer economically if the information was to be disclosed.

3. Enforcement

Responsibilities of ministries and central government agencies

Ministries in Sweden generally have relatively small staffs and their work is largely devoted to policy-making. The responsibilities for supervision is given to a number of semiautonomous government agencies (General-Directorates) under but outside the ministries. Table 3A shows the responsibilities of central, regional and local authorities with regard to 'direct supervision' (inspections, etc.) under the Environmental Code.

Regional(State) and local(municipa)l supervision

The County Administrative Board (Sw länsstyrelse) exercises supervision within the county. Municipal authorities engaged in work within the environmental or health protection area exercise supervision within each municipality. These authorities are often referred to as Environmental Boards. Regional and local supervision of the working environment is exercised by the Labour Inspectorate. (The National Board of Occupational Safety and Health and the Labour Inspectorate together constitute the Swedish Occupational Safety and Health Administration.) Special conditions apply to the National Defence. Control of transports of dangerous goods are carried out by several authorities e.g. the police.

Chemical emergency information centres for accident prevention and response

There are two chemical emergency information centres in Sweden; the Swedish Poisons Information Centre in Stockholm and the Swedish Rescue Services Agency in Karlstad. The Swedish Poisons Information Centre monitors and gives information on acute poisonings and accidents related to human exposure to chemicals in all situations i.e. on an individual basis and in mass exposure situations. The Centre also acts as the Chemical Emergency Response Centre for the Swedish Chemical Industry. This means that the Centre gives information on environmental aspects of chemical release, provided that the chemical industry has supplied this information to the Centre. This activity is run in close collaboration with the Swedish Rescue Services Agency.

The Swedish rescue Services Agency is responsible for chemical emergency information dealing with activities related to rescue actions and environmental aspects.When an accident happens where chemicals are involved e.g. when transporting dangerous goods, the rescue leader seeks relevant information on how to deal with the chemical(s) first of all in his own files. Pertinent information can also be found in the transport documents. Information is also available from the Rescue Services Information Bank at the Swedish Rescue Services Agency. This Agency has a stand-by person ready (within half an hour) to assist municipal rescue services in all types of

accidents.

Co-ordinating mechanisms

The co-ordinating mechanisms at the ministerial level, at agency level as well as between the levels are well established and work effectively. The necessary co-ordination is assured by e.g. regulations in Government Ordinances or in other government decisions. The roles of existing government agencies are as a rule well defined through relevant legal acts. Chapter 26 of the Environmental Code states that, when warranted, the supervisory agencies shall co-operate in the work of supervision.

The National Chemicals Inspectorate, the Swedish Environment Protection Agency and the National Board of Occupational Safety and Health have agreed on common strategies for chemicals control nationally and internationally. The ministries as well as the agencies when preparing legislation and other decisions concerning chemicals as a rule invite other ministries and agencies involved to take part or come up with comments. Outside parties are frequently brought in (cf. Chapters 5 and 6).

Laboratory infrastructure

Table 3B gives an overview of in-house and external (commercial) laboratory facilities available for chemicals control. Table 3C shows the total number of private and public laboratories with accreditation available for chemical analysis in Sweden.

Activities of industry, public interest groups and the research sector

The Government as well as the government agencies act openly with respect to non-governmental organisations, other interested parties and the general public. Working groups and reference groups, hearings and other types of consultations are frequently used in both the legislative work and other types of decision making in order to let interested parties get information as well as to contribute with viewpoints and comments. NGOs have as a whole good opportunities to share their views on risks as well and on the need for risk reduction measurements. In general the degree of co-operation between non-governmental sectors and the government and the agencies is comprehensive, open and constructive.

The industrial branches are as a whole very active with respect to information and education to their member enterprises. Several branches have developed consultant services towards the companies thereby contributing expertise which especially small or medium sized enterprises otherwise could not afford. Many branches have taken joint steps in order to find solutions to problems within the branch. Lately the whole dealers and retailers organisations have been very active in promoting development and marketing of environmentally friendly chemicals and other types of products to private consumers.

The environmental organisations are very active in raising the public awareness as are the labour

unions with respect to their members. They both inform of government activities and criticize the same when not being considered adequate, but rather insufficient or even non-existing.

Industry, the labour unions and the environmental organisations frequently present data from research they support or from research made outside the country in order to influence the government and the agencies. These data are assessed and used if found to be relevant for actions.

Table 3A. Municipal (Local) and State(central and regional) authorities for 'direct supervision' under the Environmental Code *

Authority	**Responsibility**
Environmental Protection and Public Health Committees (local/municipal)	Chemicals control as defined by the Environmental Code
County Administrations (regional/state)	Protection of the natural environment in connection with use of chemical products and bio-technical organisms
Labour Inspectorate (regional) (Ministry of Industry)	Supervision in connection with permits given under the Ordinance on Pesticides by the National Board of Occupational Safety and Health
National Chemicals Inspectorate (Ministry of Environment)	Manufacturers and other primary suppliers of chemical products and bio-technical organisms available. (Exceptions: cosmetics and hygiene products, materials and products intended to come in contact with foods, nipples, motor fuels, substances affecting the ozone layer, and batteries)
Medical Products Agency (Ministry of Health and Social welfare)	Manufacturers and other primary suppliers of cosmetics and hygiene products.
National Food Administration (Ministry of Agriculture)	Material and products intended for contact with food, and nipples
Swedish Maritime Administration (Ministry of Industry)	Use at sea of substances which affect the ozone layer

* Source: Ordinance on Supervision under the Environmental Code (SFS 1998:900)

Table 3B. Internal and external laboratory facilities used by supervising agencies

Agency	Internal laboratory Facilities ?	Use of external laboratories
Customs	Yes	
Medical Products Agency	Yes, for quality control of drugs	
National Board of Health and Welfare	No	Infrequently used for control of tobacco products
National Chemicals Inspectorate	No	Infrequently used for quality control of pesticide products
National Food Administration	Yes, for monitoring of pesticide residues, heavy metals, etc.	Permanent use of 4-5 regional contract laboratories for monitoring of pesticide residues
National Institute for Working Life	Yes, for toxicological and related research	
National Poisons Information Centre	No	Analysis of drugs and chemicals in case of acute poisoning are performed by laboratories located at various hospitals
Swedish Environmental Protection Agency	No	Permanent use of 5-6 laboratories for monitoring of heavy metals, persistent organic pollutants, etc.

Table 3C. Number of analytical laboratories with accreditation 1996 [1]

Type of Analysis	**Number of Laboratories with Accreditation**
Chemical Composition	52
Environmental Samples	192
Metals	53
Organic Environmental Pollutants	7
Pesticides	3
Pharmaceuticals	9
Wood Preservatives	1
Work Environment	1
Total Chemical Analysis	231[2]

[1] Source: SWEDAC 1996
[2] One laboratory has a Good Laboratory Practice (GLP) certificate (2000)

4. Information Sources and International Linkages

Availability of data for chemicals management

The main sources of information for risk assessment in Sweden is the international scientific literature. In Sweden most of the scientific research in the area of toxicology, ecotoxicology and environmental pollution is performed within universities. There are also a number of research institutes serving the public and government agencies with hazard assessments and risk related research, for example the National Institute for Working Life and the National Institute of Environmental Medicine.

In addition to generally acknowledged international bibliographic databases such as RTECS, MEDLINE, and TOXLINE, there are some national sources such as the Poisons Information Centre at the Karolinska Institute, the Chemical Products Register and the Pesticides Register at the National Chemicals Inspectorate. Other sources are RISKLINE, a database containing peer reviewed information, produced by KemI, and ARBLINE, covering the occupational health area. There are specific registers covering pharmaceuticals (partly confidential data), death causes, birth defects and cancer and a special Twin Register.

In the occupational health field there is a system for workplace monitoring related to the use of specific designated chemicals and from time to time specific research projects where biological monitoring of chemicals exposure is studied.

Location of national data

Table 4A gives an overview of available data related to chemicals management and provides information on how to gain access to such data. The Table also indicates sources of data, who has access to the data and the form in which data is maintained. Documents belonging to government agencies are as a rule available to the general public on request. Some data, however, are classified due to e.g. business secrets

Awareness and understanding of workers and the public

Sweden has the requirements for provision of information to the workers. The system includes regulations for classification, labelling and Material Data Sheets (MSDs) when marketing chemicals. The employers have the obligation to label chemicals used in the working places, to assure that MSDs are available as well as appropriate safety instructions (oral and written), for

the kind of work carried out. They also have to inform the workers about the overall safety procedures in the enterprise.

Government agencies and other institutions in the field of occupational safety and health offer education to various specialists (physicians, nurses, safety controllers) working with occupational safety and health. They also produce and distribute written information on important issues.

The Swedish Employers' Confederation (Sw. Arbetsgivareföreningen) and the trade unions have established a joint institution (Sw. Arbetarskyddsnämnden) with the task to produce educational material and information on safety and health at work. The production is comprehensive and includes books, booklets, brochures. Their information (also available on electronic media) is widely used in the enterprises by both employers and unions. The educational material is often specially adjusted for use in study circles. A number of private organisations and consultants offer seminars and courses on chemicals assessment and management.

The consumers get information on specific chemicals via labelling and if necessary supplementing information which the producers and importers have to present when marketing chemicals. The educational system provides basic information on chemicals at all levels.

Also government agencies and the municipalities produce and distribute information to the public inter alia in the form of newsletters, periodicals, booklets and brochures. At the public libraries in each municipality more comprehensive information is available to everyone. The libraries of agencies and other public institutions are open to the public as well.

The non-governmental environmental organisations have several types of activities directed towards the public. For their members they produce periodicals and other types of information. They also arrange local study circles on different topics which are open to everyone. Their booklets and brochures are sometimes distributed to all households.

The Swedish government has established a National Agenda 21 Committee to initiate, coordinate and support local work with Agenda 21 issues. All municipalities actively take part in activities initiated by the national and local committees. A new policy to reduce unemployment is to engage unemployed persons as environment information officers with the task to study local environmental problems and to disseminate information to companies and the general public.

Availability of international literature and databases

Libraries of government agencies, universities and research institutes all have their own literature or easy access to relevant international periodicals and other publications in chemistry, engineering, toxicology, ecotoxicology, public health, environmental sciences, occupational safety etc. Sometimes research institutes, universities, other libraries, industry and other non-governmental organisations have access to international sources of information which may not be easily available through the agencies.

The general public has access to documents and other information stored by government agencies unless classified due to business secrets.

National information exchange systems

The *Medical Products Agency* handles all reports from health professionals in Sweden concerning suspected risks based on observed effects on patients during exposure to pharmaceuticals (medicinal products or drugs). This information is stored in a database which is used continuously as a signal generation tool indicating any new suspected risks. The information is used on a national basis by the MPA but also regionally by 6 regional adverse drug reaction monitoring centres (supervised by the MPA and located at university hospitals) which give health care professionals direct access.

Information from these centres is transferred fortnightly to the international adverse drug reaction database at the WHO Monitoring Centre for Adverse Drug Reactions in Uppsala (Sweden). International information on suspected risks of pharmaceuticals from 46 countries taking part in the WHO monitoring programme is stored in this database. The information can be retrieved by each national agency and used for the generation of signals about risks with pharmaceuticals.

Information from published literature reports is continuously scrutinised for new suspected risks. Exchange of information about risks between national institutions and national agencies within the European Union and (some ?) other countries is frequent. Information from national registers holding data about prescriptions and sales of pharmaceuticals, morbidity, mortality and birth defects are used for risk analysis.

Identified significant risks are always analysed nationally and by the manufacturer. Moreover, risks are frequently analysed together with other national agencies mainly within the European Union. Information about risks is regularly published in the MPA Bulletin and is, as appropriate, included in the product information.

The general public has access to data available in the Summary of Product Characteristics and to published information (FASS - Farmaceutiska Specialiteter i Sverige) from the license holder.

Table 4A. Location of national data

Type of Data	Location(s)	Data Source	Format
Chemical Accident Response Information	Swedish Rescue Services Agency	Finnish TOKEVA Project and national information	CD-ROM
Chemical and physical data, classification and labelling	Swedish Rescue Services Agency	Various sources	CD-ROM
Chemical Use Statistics	National Chemicals Inspectorate	Importers and Manufacturers	Database. Compiled and adapted data published annually.
Hazardous Waste Data	Swedish Environmental Protection Agency	Importers and waste treatment facilities	Published reports
Import Statistics	National Chemicals Inspectorate, Statistics Sweden	Importers and Customs	Database. Compiled and adapted data published annually.
Industrial Accident Reports	Swedish Poisons Information Centre	Swedish Poisons Information Centre Annual Reports, data from hospitals reported to the Centre, and Emergency Response Centre data	Booklet
Inventory of Existing Chemicals	National Chemicals Inspectorate	Manufacturers and importers	Database
Occupational Health Data (agricultural)	National Board of Occupational Safety and Health	ISA – The National Information System on Work Injuries, The National Board of Occupational Safety and Health	Publications
Occupational Health Data (industrial)	National Board of Occupational Safety and Health	ISA – The National Information System on Work Injuries, The National Board of Occupational Safety and Health	Publications

Type of Data	Location(s)	Data Source	Format
Poisoning Statistics	Swedish Poisons Information Centre	Swedish Poisons Information Centre Annual Reports, data from hospitals reported to the Centre, and Emergency Response Centre data	Booklet
Production Statistics	National Chemicals Inspectorate, Statistics Sweden	Manufacturers	Database. Compiled and adapted data published annually.
Register of Approved Pesticides	National Chemicals Inspectorate	National Chemicals Inspectorate	Database and annual publication
Register of Importers	National Chemicals Inspectorate	Importers	Database
Register of Producers	National Chemicals Inspectorate	Importers and manufacturers	Database
Register of Toxic Chemicals	Swedish Poisons Information Centre (and the National Chemicals Inspectorate)	Manufacturers and importers	Databases
Sales Statistics for Pesticides (active substances)	National Chemicals Inspectorate	Registration holders	Annual publication
Statistics from Response Actions	Swedish Rescue Services Agency	Local rescue services and the Coast Guard	CD-ROM
Transport Accident Reports	Swedish Poisons Information Centre, Swedish Rescue Services Agency	Swedish Poisons Information Centre Annual Reports, data from hospitals reported to the Centre, and Emergency Response Centre data	Booklet

Table 4B. International linkages

International Agreements, Conventions, Networks, etc.	**National Contact Point***
Baltic Marine Environment Protection Commission/ Helsinki Commission (HELCOM); www.helcom.fi	Swedish Environmental Protection Agency
Basel Convention on the Control of transboundary Movements of Hazardous Wastes and Their Disposal; www.unep.ch/basel/	Swedish Environmental Protection Agency
CEFIC – European Chemical Industry Council; www.cefic.org	Association of Swedish Chemical Industries
Chemical Weapons Convention; www.opcw.org	National Inspectorate of Strategic Products
Codex Alimentarius (FAO/WHO) ; www.fao.org/WAICENT/FAOINFO/ECONOMIC/ESN/codex/default.htm	National Food Administration
Convention for the Prevention of Marine Pollution from Land-Based Sources / The MARPOL convention; www.ifs.univie.ac.at/intlaw/konterm/vrkon-w/html/doku/marpol.htm	National Maritime Administration
Convention on Long-Range Transboundary Air Pollution (CLRTAP); 130.227.176.66/aarhus-conference/newslet/articels/airpolu.htm	Swedish Environmental Protection Agency
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter / London Dumping Convention; www.miht.gov.my/policy/treaty_multidim/ldc72.htm	Swedish Environmental Protection Agency
European Crop Protection Association (ECPA); www.gcpf.org	IVT – Association of Swedish Plant and Wood Protection Industries

International Agreements, Conventions, Networks, etc.	National Contact Point*
Global Environmental Information Exchange Network / International Environmental Information System (UNEP-INFOTERRA); www.unep.org/infoterra/welcome.htm	Swedish Environmental Protection Agency
Intergovernmental Forum on Chemical Safety (IFCS); www.who.int/ifcs/	National Chemicals Inspectorate
International Occupational Safety and Health Information Service (ILO-CIS); www.ilo.org/english/protection/safework/cis/index.htm	CIS Service, National Institute for Working Life
London Guidelines for the Exchange of Information on Chemicals in International Trade (UNEP); irptc.unep.ch/pic/lunguien.htm	National Chemicals Inspectorate
Montreal Protocol on Substances that Deplete the Ozone Layer; www.unep.org/ozone/montreal.htm	Swedish Environmental Protection Agency
OECD/UNEP Chemical Accident Prevention, Preparedness and Emergency Response; www.oecd.org//ehs/ehsmono/#ACCIDENT	Swedish Rescue Services Agency; Swedish Poisons Information Centre
OSPAR - Commission for the Protection of the Marine Environment of the North-East Atlantic / Oslo-Paris Convention; www.ospar.org	Swedish Environmental Protection Agency
Persistent Organic Pollutants (POPs) Network (UNEP); www.chem.unep.ch/pops/	Swedish Environmental Protection Agency, and the National Chemicals Inspectorate
Pollutant Release and Transfer Registers (PRTR); irptc.unep.ch/irptc/docs/newslt11.htm#PRTR www.oecd.org/ehs/ehsmono/#PRTRS	Swedish Environmental Protection Agency
Rotterdam Convention / Prior Informed Consent	The National Chemicals Inspectorate

International Agreements, Conventions, Networks, etc.	**National Contact Point***
(PIC) Procedure (UNEP/FAO); www.pic.int	
UNITAR Informal Capacity Building Network; www.unitar.org/cwm/cbnetwork/networkcp.htm	The National Chemicals Inspectorate
United Nations Recommendations on the Transport of Dangerous Goods; www.unece.org/trans/main/dgdemo/contents.htm	Swedish Rescue Services Agency (land transport); Swedish Maritime Administration (sea transport); Civil Aviation Administration (air transport)

* For addresses and telephone numbers, please see Appendix 2 below

5. Health and Environmental Concerns [17]

Chemicals represent a large group of products that may affect our health and standard of living, and many aspects of our daily lives. They may also affect the economy and the environment. Some chemical products are sold directly to consumers, while others are used to produce hundreds of thousands of different goods and services. Chemical manufacturing is one of the world's largest industries, and chemicals account for around 13 per cent of world trade in manufactured goods. Modern society depends heavily on large quantities of chemicals. Today, tens of thousands of different chemical substances are in use all over the world. The use of such substances will, as a result of their inherent properties and exposure pattern, pose a risk to human beings and/or the environment, and there is therefore a need for regulation. At the beginning of the 1960s, the first modern legislation to control chemicals was introduced in Sweden, and over the years international negotiations have become increasingly important as a basis for national decisions. Swedish legislation places the main responsibility on the manufacturer or importer, and the watchwords are the precautionary principle, the polluter pays principle, and substitution – the replacement of hazardous substances with less dangerous alternatives. Some chemicals, such as pesticides, require permits before they are allowed to go on sale. About one-half of all chemical products in use in Sweden are classified as hazardous to health or the environment. A large fraction of these are toxic and persistent in the environment, and liable to bioaccumulate. Substances that have particularly unwanted properties in these respects have been in focus. Even if they are built into goods, they may in a longer time perspective be bioavailable and circulate in the environment in unpredictable ways. One of the Swedish Environmental Quality Objectives is 'A non-toxic environment'. It has been adopted by the Swedish Parliament and is defined in the following terms: 'The environment must be free from man-made substances and metals that represent a threat to health or biological diversity.' Parliament has also adopted new approaches for chemicals policy in order to achieve that goal. These include the following guiding principles.

New goods introduced onto the market should be free from the following substances:

- Organic man-made substances that are persistent and liable to bioaccumulate, and substances giving rise to such substances;
- Man-made substances that are carcinogenic, mutagenic, teratogenic or endocrine disruptive, including those which have adverse effects on the reproductive system;
- Mercury, cadmium, lead and their compounds should not be released into the environment to a degree that causes harm to the environment or human health.

The fundamental principle is to ban all chemicals with certain inherent properties and thus

[17] Source: The Environment Must be Free From Man-made Substances and Metals that Represent a Threat to Health or Biological Diversity, L-E Liljelund, G Bengtsson, EnviroReport No. 4, 2000, p.2

reduce the risk of harmful impacts from chemicals in products through their entire life-cycles.

A Committee on New Guidelines on Chemicals Policy has recently forwarded its proposals to the Government on how to define these new guidelines. The new guiding principles will hopefully serve as a contribution to the European Commission's work on a new chemicals policy. A proposal by the Commission is expected later this year.
policy.

Table 5A. Some major chemicals policy documents

Government Body and Year of Policy Document	Title of English-language Document or Summary
Commission on Environmental Health, Ministry of Health and Social Affairs, 1996	Environment for Sustainable Health Development [18]
Chemicals Policy Committee (Sw. Kemikommittén), Ministry of Environment, 1997	Towards a Sustainable Chemicals Policy [19]
Government, 1997/1998	Swedish Environmental Quality Objectives [20]; www.regeringen.se/inenglish/publications.htm
National Chemicals Inspectorate (Ministry of Environment), 1999	A Non-toxic Environment: One of the Swedish Environmental Quality Objectives [21]; www.kemi.se/organisation/reguppdr/giftfri/summary.pdf
Swedish Environmental Advisory Council (Sw. Miljövårdsberednigen), Ministry of Environment, 1998/1999	Twelve Indicators to Assess Sustainability, Swedenvironment No.5, 1999 [22]; www.swedenvironment.environ.se/no9905/9905.htm
Commission for Measures Against Climate Change, Ministry of Environment, 2000	Proposed Swedish Climate Strategy [23], www.hallbarasverige.gov.se/eng/vagar_till/klimatpolitik/klimatpolitik.htm
Committee on Environmental Quality Objectives (Sw. Miljömålskommittén) , Ministry of Environment, 2000	The Future Environment – Our Common Responsibility [24]; www.hallbarasverige.gov.se/pdf/miljomal-eng-sammanf-sou2000-52.pdf
Committee on New Guidelines on Chemicals Policy (Sw. Kemikalieutredningen), Ministry of Environment, 2000	Summary of the Report of the Swedish Committee on New Guidelines on Chemicals Policy [25]; www.hallbarasverige.gov.se/pdf/kemikalieutredn-eng-sammanf.pdf

[18] Miljö för en hållbar hälsoutveckling: Förslag till nationellt handlingsprogram (SOU 1996:124, three volumes)
[19] En hållbar kemikaliepolitik (SOU 1997:84, three volumes)
[20] Proposition 1997/98:145
[21] Miljökvalitetsmål 12: Giftfri miljö (September 1999)
[22] Gröna nyckeltal för en ekologiskt hållbar utveckling (SOU 1998:170), and Gröna nyckeltal – följ den ekologiska omställningen (SOU 1999:127)
[23] Förslag till svensk klimatstrategi (SOU 2000:23)
[24] Framtidens miljö, allas vårt ansvar (SOU 2000:52, two volumes)
[25] Varor utan faror. Genomförande av nya riktlinjer inom kemikaliepolitiken (SOU 2000:53)

Appendix 1:

Resource Material in English

A Common Strategy for International Chemicals Control Work in Sweden, National Chemicals Inspectorate, Swedish Environmental Protection Agency, and National Board of Occupational Safety and Health, Solna, 1995 (78 pp)

A Comparison of the Nordic Product Registers, Nordic Council of Ministers, TemaNord 1999:586, Copenhagen, 1999

A Priority Setting Scheme for Scoring Hazardous Properties, Report No 2/95, National Chemicals Inspectorate, Solna, 1995 (49 pp)

Agriculture in Sweden, Swedish Institute, http://www.si.se/eng/esverige/agricule.html, December 1997

Alternatives to persistent organic pollutants, Swedish National Chemicals Inspectorate, and Swedish Environmental Protection Agency, 1996

Care of Casualties in Chemical Accidents, Official Recommendations, National Board of Health and Welfare, Stockholm, 1991

Chemical Industry in Sweden: Facts and Figures, Association of Swedish Chemical Industries, May 2000

Chemical Protection in Medical Care - Decontamination and Treatment in Peacetime, Crisis and War, National Board of Health and Welfare, Stockholm, 1996

Chemicals, EnviroReport No. 4, Swedish Environmental Protection Agency, 2000 (in press); www.environ.se/enviroreport/

Chemicals Control - To Manage Chemical Hazards at Work, National Board of Occupational Safety and Health, Solna, 1996

Comparative assessment, the substitution principle and risk/benefit approach in regulatory decision making, Swedish National Chemicals Inspectorate, October 23, 1997

Consumption and Stocks of Some Chemicals and Plastics 1998, Statistics Sweden, Mi 47 SM 9901, September 1999 (in Swedish with English summary)

Environment for Sustainable Health Development [in Swedish with English Summary], Commission on Environmental Health, SOU 1996:124, Ministry of Social Affairs, Stockholm, 1996

Environmental Code, http://miljo.regeringen.se/pressinfo/pdf/eng1.pdf (Summary in English)

Environmental Performance Reviews: Sweden, Organisation for Economic Co-operation and Develop-

ment, Paris, 1996

Environmental Policy for Organic Pollutants, A background document for Strategy for Sustainable Development: Proposals for an action programme, Report 4252, Swedish Environmental Protection Agency, Solna, 1993 (46 pp)

Environmental Pollution and Health, The Environment in Sweden - Status and Trends, Swedish Environmental Protection Agency, Solna, Report 4249, 1993 (64 pp)

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IPP – Integrated Product Policy, EnviroReport No. 2, Swedish Environmental Protection Agency, January 2000; www.environ.se/enviroreport/

ISO Guide 1999: Swedish Companies with Approved Quality Assurance and Environmental Management Systems, Telenor Företagsinfo, Stockholm, October 1998 (in Swedish and English)

Keeping Sweden Clean, SAKAB (undated brochure)

Laboratories with Ecotoxicological Expertise, Inventory in the Nordic Countries, NORD 1991:29, Nordic Council of Ministers, Copenhagen, 1991

List of Publications in English, National Chemicals Inspectorate, June 1998

List of Restricted Chemical Substances in Sweden, National Chemicals Inspectorate, National Board of Occupational Safety and Health and Swedish Environmental Protection Agency, 1995

Natural Resource Aspects of Sustainable Development in Sweden;
www.un.org/esa/agenda21/natlinfo/countr/Sweden/natur.htm

Non-Hazardous Products - Proposals for Implementation of New Guidelines on Chemicals Policy, SOU 2000:53, www.hallbarasverige.gov.se/eng/vagar_till/Kemikalie/index.htm (Summary in English)

Nordic Toxicological and Ecotoxicological Laboratories, Tema Nord 1996:571, Nordic Council of Ministers, Copenhagen, 1996

Observation List: Examples of Substances Requiring Particular Attention, Second edition, National Chemicals Inspectorate, 1998 (78pp)

Ordinance on Substances which Deplete the Ozone Layer (SFS 1995:636)

Pesticide Policy for the Federation of Swedish Farmers, Stockholm, February 1997

Pesticide Risk Indicators in Sweden, National Chemicals Inspectorate, December 9, 1997

Pesticide Residue Monitoring of Fruit, Vegetables and Cereals in Sweden 1998, Andersson A, Jansson A, Jahrl S, National Food Administration, Uppsala, 1999

Pesticides in Swedish Agriculture: Number of Doses 1998, Statistics Sweden, Mi 31 SM 9901, May 1999 (in Swedish with English summary)

Principles for Identifying Unacceptable Pesticides, Andersson L, Gabring S, Hammar J, Melsäter B, Report No 4/92, National Chemicals Inspectorate, Solna, 1992 (34 pp)

Product Information – A Guide to be Consulted in the Work to Classify and Label Chemical Products and When Designing Safety Data Sheets, National Chemicals Inspectorate, June 1999

Product Policy in Sweden - A country Report, Näslund S, pp 152-155 in: Green Goods - Into the future with products that favour the environment, Report 1995:5, The Ecocycle Commission, Ministry of the Environment, Stockholm, 1995

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Survey of Development Aid Projects for Capacity Building, ENV/MC/CHEM(96)25, Environmental Directorate, Organisation for Economic Co-operation and Development, Paris, September 1996

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Swedish Pesticide Risk Reduction 1981-1995: Food Residues, Health Hazard, and Reported Poisonings, Ekström G, Hemming H, Palmborg M, Rev Environ Contam Toxicol 147, 119-147, 1996

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The Environmental Code, Vinge; www.vinge.se/pub/miljbalk-eng.pdf

The Future Environment Our Common Responsibility, Report of the Committee on Environmental Objectives, SOU 2000:52, Ministry of Environment, Stockholm, June 2000, www.environment.ministry.se/propositionermm/sou/pdf (Summary in English)

The HFC Ordinance (SFS 1995:555)

The Motor Gasoline (Petrol) Ordinance (SFS 1985:838)

The National Chemicals Inspectorate's Regulations on Classification and Labelling of Chemical Products (KIFS 1994:12), and Recommendations accompanying the regulations

The National Chemicals Inspectorate's Regulations on Chemical Products and Biotechnical Organisms (KIFS 1998:8)

The PCB Ordinance (SFS 1985:837)

The Swedish Chemical Directory 1998-2000, [in Swedish with English subtitles], Fournir Förlags AB, Stockholm, 1998

The Swedish Chemical Products Register: An important Tool in Chemicals Control, National Chemicals Inspectorate, Solna, 1995 (4 pp)

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The Use of Economic Instruments in Nordic Environmental Policy, Tema Nord - Environment 1996:568, Nordic Council of Ministers, Copenhagen, 1996

Towards a Sustainable Chemicals Policy, The Chemicals Policy Committee, Government Reports 1997:84, Ministry of the Environment (English Summary)

Twelve Indicators to Assess Sustainability, SwedEnvironment No 5, Swedish Ministry of the Environment, Swedish Environmental Protection Agency and Swedish Chemicals Inspectorate, 1999, http://www.hallbarasverige.gov.se/eng/

Use of the substitution principle in regulation of pesticides in Sweden, Swedish National Chemicals

Inspectorate, November 1999

Appendix 2:

Chemicals Management Stakeholders and Their Websites

Arbetarskyddsstyrelsen/***National Board of Occupational Safety and Health***
S-171 84 SOLNA
Tel: +46-8-730 90 00
www.arbsky.se

Arbetslivsinstitutet/***National Institute for Working Life***
S-171 84 SOLNA
Tel: +46-8-730 91 00
www.niwl.se

Boverket***/Swedish Board of Housing, Building and Planning***
P.O.Box 534
S-371 23 KARLSKRONA
Tel: +46-455-530 00
www.boverket.se

IIH – Branschföreningen för Industriell och Institutionell Hygien/
Swedish Association of Industrial and Institutional Hygiene Products
P.O.Box 6620
113 84 STOCKHOLM
Tel: +46 8 522 24400
www.iih.se

Generaltullstyrelsen***/Board of Customs***
Kontrollbyrån
P.O.Box 2267
S-103 17 STOCKHOLM
Tel: +46-8-789 73 00
www.tullverket.se

Giftinformationscentralen***/Swedish Poisons Information Centre***
S-171 76 STOCKHOLM
Tel: +46-8-610 05 55
www.giftinformation.apoteket.se

IMM - Institutet för Miljömedicin***/Institute of Environmental Medicine***
P.O.Box 210
171 77 STOCKHOLM
Tel: +46-8-728 64 00
www.imm.ki.se/iem.htm

Inspektionen för Strategiska Produkter/***National Inspectorate of Strategic Products***
P.O.Box 70252
107 22 STOCKHOLM
www.isp.se

Institutionen för Miljöanalys /***Department of Environmental Assessment***
Sveriges Lantbruksuniversitet/***Swedish University of Agricultural Sciences***
Box 7050
750 07 UPPSALA
Tel: +46-18-67 10 00
www.ma.slu.se

IVT - Industrin för Växt- och Träskyddsmedel/
Association of the Plant and Wood Protection Industry
P.O.Box 5501
114 85 STOCKHOLM
Tel: +46-8-783 80 00
www.chemind.se

Jordbruksverket***/Swedish Board of Agriculture***
S-551 82 JÖNKÖPING
Tel: +46-36-15 50 00
www.sjv.se

Kemikalieinspektionen/***KEMI – The National Chemicals Inspectorate***
P.O.Box 1384
171 27 SOLNA
Tel: +46-8-783 1100
www.kemi.se

Konsumentverket***/Swedish Consumer Agency***
118 87 STOCKHOLM
Tel: +46-8-759 83 00
www.kov.se

KTF - Kemisk-Tekniska Leverantörförbundet/
The Swedish Cosmetic, Toiletry and Detergent Association
P.O.Box 6620
113 84 STOCKHOLM
Tel: +46-8-52 224 400
www.ktf.se

Luftfartsverket***/Civil Aviation Administration***
601 79 NORRKÖPING
Tel: +46-11-192000
www.lfv.se

Läkemedelsverket***/Medical Products Agency***
P.O.Box 26
S-751 03 UPPSALA

Tel: +46-18-17 46 00
www3.mpa.se

Miljödepartementet/***Ministry of the Environment/***
103 33 STOCKHOLM
Tel: +46-8-24 16 29
www.miljo.regeringen.se

Nationalkommittén för Agenda 21
/National Committee for Agenda 21/
Miljödepartementet
103 33 STOCKHOLM
Tel: +46-8-405 10 00
www.agenda21forum.org

Naturskyddsföreningen
/*Swedish Society for Nature Conservation*/
P.O.Box 4625
116 91 STOCKHOLM
Tel: +46-8-702 65 00
www.snf.se

Naturvårdsverket
/Swedish Environmental Protection Agency
Blekholmsterrassen 36
S-106 48 STOCKHOLM
Tel: +46-8-698 10 00
www.environ.se

Näringslivets Miljöchefer/***Swedish Association of Environmental Managers***
P.O.Box 8133
104 20 STOCKHOLM
Tel: +46 8 657 1000
www.nmc.a.se/indexeng.htm

Plast- och Kemibranscherna***/The Plastics and Chemicals Federation***
P.O.Box 105
S-101 22 STOCKHOLM
Tel: +46-8-402 13 60
www.plast-kemi.se

Räddningsverket***/Swedish Rescue Services Agency***
Karolinen
S-651 80 KARLSTAD
Tel: +46-54-13 50 00
www.srv.se

SACO - Sveriges Akademikers centralorganisation/
Swedish Confederation of Professional Associations
P.O.Box 2206
103 15 STOCKHOLM

Tel: +46-8-613 48 00
www.saco.se

SAKAB - Svensk Avfallskonvertering AB/***WMI Sellbergs' SAKAB Facility***
P.O.Box 904
S-692 29 KUMLA
Tel: +46-19-30 51 00
www.sellbergs.se/sellbergs/english.html
www.sakab.se

Sida - ***Swedish International Development Co-operation Agency***
105 25 STOCKHOLM
Tel: +46-8-698 30 00
www.sida.se

Sjöfartsverket/***Swedish Maritime Administration***
601 78 NORRKÖPING
Tel: +46-11-191000
www.sjofartsverket.se

Socialstyrelsen***/National Board of Health and Welfare***
S-106 30 STOCKHOLM
Tel: +46-8-783 30 00
www.sos.se

SP - Sveriges Provnings- och Forskningsinstitut/
Swedish National Testing and Research Institute
P.O.Box 857
501 15 BORÅS
Tel: +46-33-16 50 00
www.sp.se

Sprängämnesinspektionen***/National Inspectorate of Explosives and Flammables***
P.O.Box 1413
S-171 27 SOLNA
Tel: +46-8-799 8330
www.sprangamnes.se

Statens livsmedelsverk***/National Food Administration***
P.O.Box 622
S-751 26 UPPSALA
Tel: +46-18-17 55 00
www.slv.se

Statens strålskyddsinstitut***/Swedish Radiation Protection Institute***
171 16 STOCKHOLM
Tel: +46-8-729 10 00
www.ssi.se

Statistiska Centralbyrån***/Statistics Sweden***

Karlavägen 100
S-115 81 STOCKHOLM
Tel: +46-8-783 40 00
www.scb.se

SWEDAC - Styrelsen för ackreditering och teknisk kontroll/
Swedish Board for Accreditation and Conformity Assessment
P.O.Box 2231
103 05 STOCKHOLM
Tel: +46-8-402 00 70
www.swedac.se

Svenska Institutet***/The Swedish Institute***
P.O.Box 7434
103 91 STOCKHOLM
Tel: +46-8-789 20 00
www.si.se

Svenska Miljöforskargruppen AB/***Swedish Environmental Research Group***
Bällstavägen 190
161 52 BROMMA
Tel: +46-8-37 05 97

Svenska Petroleuminstitutet/***Swedish Petroleum Institute***
Nybrogatan 11
114 39 STOCKHOLM
Tel: +46-8-667 09 25
www.spi.se

SVEFF – Sveriges Färgfabrikanters Förening/
Swedish Paint and Printing Ink Makers' Association
P.O.Box 6620
113 84 STOCKHOLM
Tel: +46 8 522 24400
www.sveff.se

Sveriges Kemiska Industrikontor/***Association of Swedish Chemical Industries***
P.O.Box 5501
S-114 85 STOCKHOLM
Tel: +46-8-783 80 00
www.chemind.se

Överstyrelsen för civil beredskap***/Swedish Agency for Civil Emergency Planning***
P.O.Box 47333
100 74 STOCKHOLM
Tel: +46-8-691 10 00
www.ocb.se

Appendix 3:

The Chemical Products Register in Brief [26]

The Chemical Products Register (Sw. Produktregistret) is a large database kept by the National Chemicals Inspectorate. The register contains information on approximately 60 000 chemical reports from 2 500 companies. In addition, 130 000 substances with synonyms are contained in a special file in the database. The register provides particulars about function, industrial category, classification, composition and quantities of chemical products imported to or manufactured in Sweden. The information is used to support work on risk assessments, statistical calculations, substance flow analyses and supervision. Although the database information is used mainly to support activities conducted by the National Chemicals Inspectorate, other authorities, researcher workers, organisations and the public may use the information.

Who should report ?

The importer of a chemical product to Sweden is obliged to report to the Chemical Products Register. A manufacturer has the same obligation. Provisions for the Products Register are contained in the Environmental Code (SFS 1998:808), the Chemical Products and Biotechnical Organisms Ordinance (SFS 1998:941), the National Chemicals Inspectorate's Chemical Products and Biotechnical Organisms Regulations (KIFS 1998:8), and in the Chemical Charges Ordinance (SFS 1998:942).

The National Chemicals Inspectorate may, in special cases, authorise a commercial agent to submit the report instead of an importer. In such cases, legal advice should be requested from the Inspectorate.

A foreign supplier does not always provide the Swedish importer with information on the full composition of a chemical product, although the Inspectorate recommends co-operation to this effect. The supplier may therefore send information on the composition directly to the Register. The name of the Swedish importer and the trade names of the chemical products on the Swedish market should be given in such cases.

Obligations of the reporter

Professional manufacture in or import to Sweden of chemical products and biotechnical organisms must be reported to and registered in the Products Register. This requirement applies to chemical products and biotechnical organisms assignable to any of the product

[26] www.kemi.se/default_eng.cfm?page=klass_mark/klasshem_eng.htm

categories covered by legislation. The manufacturer or, when the product is imported, the importer is responsible for the submission of a report to the Register.

The term manufacturer is also taken to mean anyone who packages, repackages or changes the name of a chemical product or biotechnical organism for further transfer in his own name without having imported or manufactured the product or organism.

Anyone who annually manufactures or imports less than 100 kg of a chemical product is not required to submit a report, unless the Inspectorate has decided otherwise. The Inspectorate may, in special cases and if it is acceptable from the standpoint of human health and environmental protection, authorise a commercial agent to submit the report instead of an importer. Report forms can be obtained from the Inspectorate. Reports must be submitted to the Register not later than on 28 February of the calendar year after the product became notifiable.

Access to the Chemical Products Register

Since secrecy applies to much of the information submitted to the Chemical Products Register only registry staff are authorised to register or retrieve product information from the database. The Register is localised within a closed area and admittance to other Inspectorate staff is not allowed without permission.

What information is retrievable and how can interested parties obtain it ?

Information in the database can be retrieved by searching on function, industrial category, customs tariff number, classification, chemical substance and total quantity. Based on data in the register, flow analyses of substances are produced each year and also a survey of a number of high-volume chemicals resulting in information on imported and domestically manufactured quantities, trade descriptions and industrial categories, etc.

Any request from outside the Inspectorate to obtain information from the database is treated on a case-by-case basis taking into account applicable secrecy provisions. Requests should be addressed to the Chemical Products Register, preferably in writing, providing details on the nature of the information requested.

Chemical Products Register, Swedish National Chemicals Inspectorate, P.O.Box 1384, SE-171 27 Solna, Sweden, Phone: +46-8-783 1183, Fax: +46-8-825508, e-mail: produktregistret@kemi.se

Secrecy

Regulations on secrecy applicable to the National Chemicals Inspectorate are contained in the Act on Secrecy (SFS 1998:100) and in the Ordinance on Secrecy (SFS 1980:657).
Secrecy shall apply to information about a private subject's business or management conditions, inventions or research results, if it can be assumed that the natural or legal person concerned would suffer loss if the information was disclosed. Secrecy means that it is prohibited to disclose or use the information, unless authorisation has been given. When the Inspectorate receives a request to obtain information contained in the register, it has to consider each request on a case-by-case basis, applying the secrecy regulations. This procedure applies to the authority as such and to its employees alike.

Information to which secrecy applies may, however, be communicated to a public authority if it is evident that the interest of the information being communicated prevails over the interest which the secrecy purports to protect. Such information may also be communicated to a private subject by imposing a restriction limiting the private subject's right to communicate or use the information. The relevant authority shall impose such restriction when the information is communicated.

Appendix 4:

Future Chemicals Policy Proposals[27]

A substantial number of policy documents with relevance to chemicals and pesticides management and control issues have been produced by Government commissions and other government-related bodies over the last two decades. Table 4:1 shows the most recent ones with relevance to chemicals management.

Of the most recent committees, the *Committee on Environmental Quality Objectives* had the task of drawing up sub-goals and measures for the overarching environmental goals. One of the targets is concerned with the achievement of a "non-toxic environment". In order for this target to be achieved, the Government believes that new guidelines should be added to the existing policy on chemicals. The new guidelines are as follows:

- New goods introduced onto the market are free from the following substances:
    - Organic, man-made substances that are persistent and liable to bioaccumulate, and substances giving rise to such substances;
    - Man-made substances which are carcinogenic, mutagenic and endocrine disruptive, including those which have adverse effects on the reproductive system;
    - Mercury, cadmium, lead and compounds thereof.
- Metals are used in such a way that they are not released into the environment to a degree that causes harm to the environment or human health.
- Organic, man-made substances which are persistent and bio-accumulative may occur in production processes only if the enterprise can show that neither health nor the environment are harmed. Permits and conditions under the Environmental Code are devised in such a way that this guideline can be assured.

The guidelines should provide guidance for manufacturers´ product development and serve as a goal for their chemicals strategies, and also provide support for the work of national authorities and for implementation of the Swedish Environmental Code. It is the Government's intention to work to ensure the implementation of these guidelines within 10-15 years.

In the Government Bill on Swedish Environmental Targets, the Government gives as its general view that all chemical safety work should emanate from risk assessments. Current working methods should be supplemented by a general approach focusing on chemical

[27] Text based on Swedenvironment, No. 3, 2000; www.swedenvironment.environ.se

substances with documented health-endangering properties and on organic, man-made substances which are bio-accumulative and persistent. The present working procedure, based on evaluations of one chemical substance at a time, is inadequate and too slow, added to which, certain substances are very difficult to assess in terms of the risk they involve. This is especially the case with anthropogenic substances which are bio-accumulative and persistent.

The *Committee on New Guidelines on Chemicals Policy* in its report proposed that the new guidelines on chemicals policy should be implemented jointly with the European Union. It is proposed that the European Union's policy and rules in the chemicals area be tightened up.

Knowledge of the health and environmental properties of all chemical substances shall be available not later than 2010, since such information is lacking for a large portion of the substances currently used.

Chemical substances that are carcinogenic, mutagenic and toxic to reproduction may not be present in consumer-available products from 2007. Chemical substances that are particularly persistent and bio-accumulating may not be present in products from 2010. Other persistent and bio-accumulating substances may not be present in products from 2015.

The knowledge requirement should be expanded. Today there is a lack of knowledge regarding health and environmental properties for the chemical substances that have long been on the market. In order for new substances to be marketed requirements are made on knowledge of their properties. The Committee proposed that all chemical substances on the market be subject to the same data requirements. Substances that do not meet the requirements may not be placed on the market after a certain date.

For all chemical substances produced in high quantities (1 000 tonnes per year or more), manufacturers or importers should have compiled such data not later than at the end of 2005. For substances produced in medium quantities (between 10 and 1 000 tonnes per year), such data should be compiled by the end of 2009, and for other substances not later than at the end of 2010.

Persistent and bio-accumulative organic substances should be phased out. Chemical substances that are particularly persistent and bio-accumulative (i.e. accumulate to a high degree in organisms) may not be present in chemical products or other manufactured products such as clothing, cars and mobile telephones as from 2010. Such products may not contain other persistent and bio-accumulating substances as from 2015.

Carcinogenic, mutagenic and reproduction-toxic substances should be phased out. There is already a ban in the EU today to the effect that chemical substances that are carcinogenic, mutagenic and toxic to reproduction may not be present in consumer-available chemical products. The Committee proposes that the ban be extended to cover other products besides chemical products (substances and preparations) as well from 2007.

In the case of endocrine-disruptive substances, the Committee proposes that efforts should be focused on enabling such substances to be detected by the development of testing methods for reproduction disruptions.

The Committee submits proposals for continued phase-out of mercury, cadmium and lead. Furthermore, other metals must be used in such a way that they do not leak out and cause harm to man or the environment. Action must be taken against the uses that give rise to widespread metal pollution.

Table 4:1. Need for chemicals management changes*

Goals	**Problems and cause of problem**	**Stakeholders and lines of action**
Increased knowledge about properties and occurrences of chemicals	Insufficient investigations due to large number of substances and complexity of issues	*Chemical and manufacturing industry:* investigations, identification of unintentionally formed substances; *Research sector*: synergistic effects
Increased knowledge about occurrences and flows of chemicals in products. Reduced leakage of chemicals from products	Present and past uses of chemical substances in preparations manufactured in Sweden or imported. Many stages of handling operations	*Chemical and manufacturing industry*: increased knowledge; *Trade, consumers and public contracting*: increased demands for contents specifications; *Property owners*: historical storage
Reduced industrial releases	Industrial processes	*Chemical industry*: changeover of processes, and release restrictions
Reduced direct exposure of human beings and the environment	Professional and consumer handling of chemical products	*Chemical and manufacturing industry, farmers and other professional users, and consumers*: increased risk awareness
Reduced leakage from landfills and safer handling of wastes	Chemicals in waste	*Chemical and manufacturing industry*: substitution and phase-out; *Municipalities*: waste plans; *Waste management companies and*

Goals	Problems and cause of problem	Stakeholders and lines of action
		consumers: waste sorting
Phase-out of substances with particularly hazardous properties	Present use of such substances, international trade, lack of alternatives and alternative techniques	*Chemical industry:* phase-out of selected chemicals; *Farmers*: reduced use of pesticides; *Consumers:* increased awareness; *International bodies*: negotiations
Reduced impact from long-range transport of pollutants	Appearance or use of chemicals abroad	*Manufacturers and users abroad, and international bodies*: negotiations
Clean-up of polluted areas	Historical spread of chemicals	*Property owners*: clean-up; *County administrations*: regional programs; *Municipalities*: waste plans; *Government*: subsidies
Increased knowledge about the state of the environment	Lack of methods; Focus on traditional contaminants	*Chemical industry*: environmental effect assessments of industry operations; *Central and regional authorities*: permits and follow up
Improved assessment of total exposure	Lack of co-ordination	*Authorities*

* Source: The National Chemicals Inspectorate, September 1999; www.kemi.se/organisation/reguppdr/giftfri/summary/PDF

Appendix 5:

Explanation of Terms

Active substance: The biologically active ingredient of e.g. an agricultural pesticide (plant protection product), a biocidal product or a pharmaceutical product

Antifouling agent: Any paint or other chemical product containing a growth-inhibiting substance intended to prevent growth on underwater surfaces

Biocidal product: Term used within the European Union to denote products containing non-agricultural pesticides and some other functional groups of chemical substances with desired biocidal properties (see Directive 98/8/EEC, Article 2)

Biocide: Chemical substance capable of killing living organisms

Biological pest control agent (Sw. biologiskt bekämpningsmedel): Bio-technical organism (virus, nematode, insect or Arachnid species) intended to prevent or counteract sanitary nuisances or damage on property from animals, plants, or micro-organisms

Bio-technical organism: A product that is produced specifically as a pest control agent or for any other technical purpose and which wholly or in part consists of or contains living microorganisms including virus, nematodes, insects or arachnids

Category of danger (Sw. faroklass): Chemical products dangerous to health or the environment shall be classified in one or more of the following categories; Very toxic, Toxic, Corrosive, Harmful, Irritant, Sensitising, Carcinogenic, Mutagenic, Toxic to reproduction, Moderately harmful, Dangerous for the environment

Chemical products: Chemical substances (including elements) and preparations

Chemical products dangerous to health or the environment: Substances and preparations satisfying at least one of the criteria listed in Appendix 3 to the National Chemical Inspectorate's Regulations (KIFS 1994:12) on the Classification and Labelling of Chemical Products, and substances listed in Appendix 5 or 6 to the regulations

Chemical Products Register: (Sw. Produktregistret) The National Chemicals Inspectorate's registry (database) of chemical products (preparations and substances)

Class 1 pesticide: A pesticide (pest control agent) which may only be used in the course of business activities by someone holding a special permit

Class 2 pesticide: A pesticide (pest control agent) which may only be used in the course of business activities

Class 3 pesticide: A pesticide (pest control agent) which may be used by anyone

Consumer chemical: A chemical product suitable (or accepted) for non-occupational use by the general

public

Environmental health: Health aspects of the human environment, including technical and administrative measures, for improving the human environment from a health point of view
(synonyms: environmental medicine, environmental hygiene)

Giftfri: non-toxic or non-poisonous

Handling: Manufacture, processing, treatment, packaging, storage, transportation, use, collection, destruction, conversion, offering for sale, transfer or other comparable proceedings

Hazardous waste: Chemical and other wastes as defined by the Ordinance (1996:971) on Hazardous Waste (see also Directives 75/442/EEC and 91/689/EEC)

Hållbara Sverige: Sustainable Sweden or Sustainable society

KEMI: The National Chemicals Inspectorate (Sw. Kemikalieinspektionen)

KIFS: The National Chemicals Inspectorate's Code of Statutes

Manufacturer: A person who produces a chemical product or packages, repackages or changes the name of a chemical product for further transfer in his own name without having imported or manufactured the product

Occupational environment: The environment at a workplace

Permit: Permits are required for

* Professional imports of extremely dangerous chemical products from countries not being members of the European Union,

* Professional transfer of extremely dangerous or very dangerous chemical products,

* Other than professional imports of extremely dangerous or very dangerous chemical products from countries not being members of the European Union,

* Other than professional handling of extremely dangerous or very dangerous chemical products,

* Use of pesticides (pest control agents) in Class 1

Pesticide (Sw. bekämpningsmedel): Chemical or bio-technical product intended for protection against damage to property, sanitary nuisances or other comparable nuisances caused by plants, animals or micro-organisms, including herbicides and desiccants, insecticides, acaricides, molluscicides and nematicides, fungicides, plant growth regulators, repellents (anti-mosquito preparations), rodenticides, wood preservatives, slimicides, products against micro-organisms in chemical toilets, antifouling products, and piscicides

Plant protection product: A term used within the European Union to denote a pesticide intended for use in agriculture (see Directive 91/414/EEC, Article 2)

Preparations: Mixtures or solutions composed of two or more substances (micro-organisms or viruses in

the case of biological pest control agents)

Public health: The branch of medicine dealing with safe-guarding and improving community health through organised community efforts

Regeringen: the Swedish Government; Council of Ministers

Riksdagen: the Swedish Parliament

SFS: Swedish Code of Statutes (Sw. Svensk FörfattningsSamling)

SOU: Government official report (Sw. Statens Offentliga Utredningar)

Urban area (Sw. tätort): Area with aggregation of houses not more than 200 meter apart and with at least 200 inhabitants