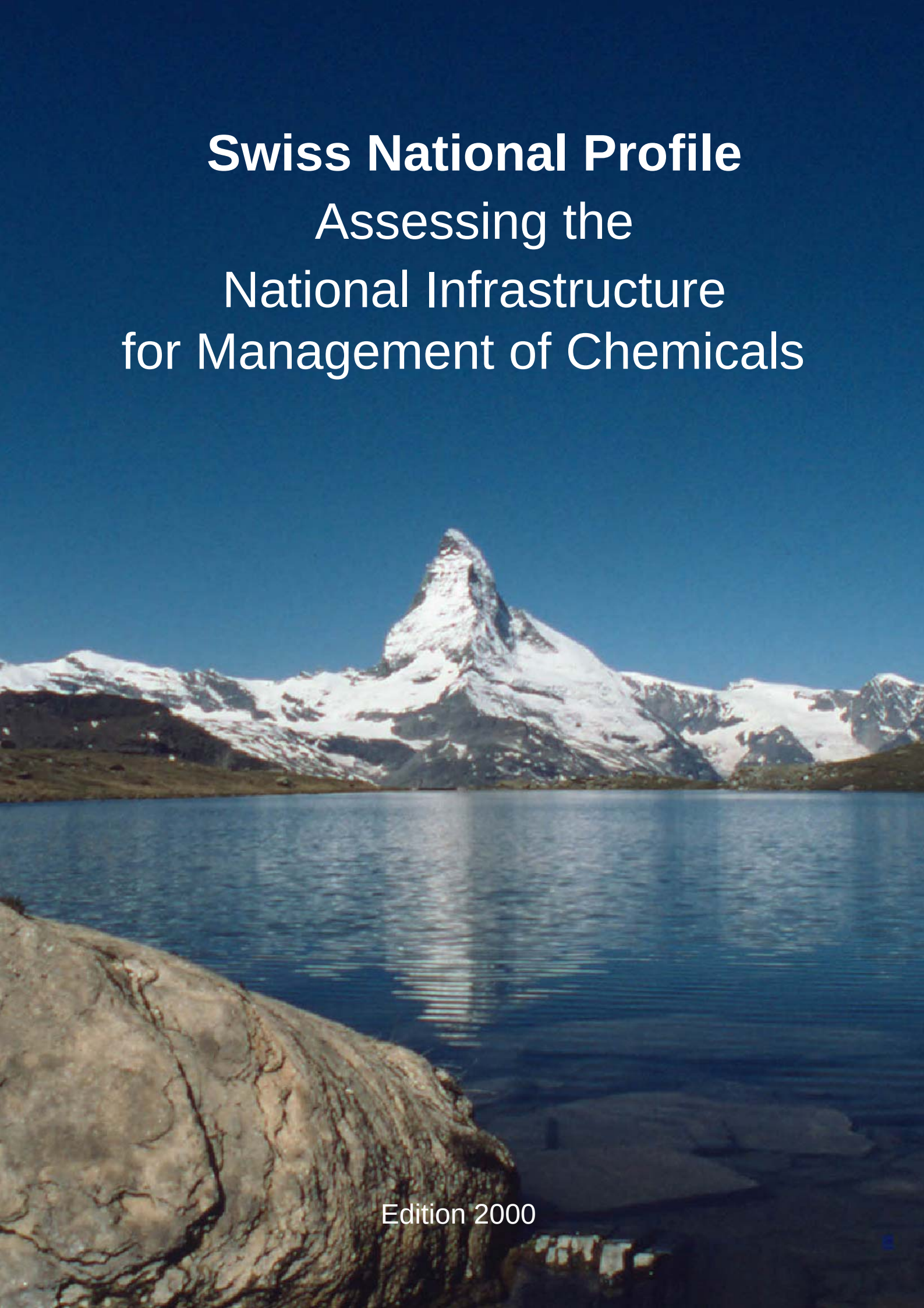
Swiss National Profile

Assessing the National Infrastructure for Management of Chemicals



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FOREWORD

Countries around the world have followed the recommendation by the Intergovernmental Forum on Chemical Safety (IFCS) and have prepared National Profiles assessing their national infrastructure for the sound management of chemicals. In order to ensure consistency and to allow comparison, IFCS recommended that countries use the UNITAR / IOMC National Profile Guidance Document in preparing their National Profiles.

The present National Profile is the first document, though earlier attempts have been made, which provides a comprehensive, integral and comparable picture and overview of Switzerland's chemicals management infrastructure. It is hoped to be of value and interest – within Switzerland as well as for other countries, and it shall contribute to the understanding of specific Swiss approaches by fostering interdisciplinary thinking and by leading to improved interactions at all the levels concerned. In particular it is meant to provide a reliable and comparable basis for judging Switzerland's chemical risks and the instruments and tools in place to control them. Thus, the present National Profile may become useful in identifying and prioritizing future steps to be taken.

The preparation of this document was not an easy task, and it would not have been completed without the dedication and the assistance of the individuals and organizations mentioned in the impressum, nor without the particular contributions of all the others who are not found in the list. We would, therefore, like to thank the author and all the contributors who participated in the discussions along the way and who helped keep the project on track.

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I INTRODUCTION TO THE NATIONAL PROFILE

I-I INTERNATIONAL SCOPE

„Agenda 21“ has been agreed upon by all the countries represented at the 1992 Conference in Rio de Janeiro. Chapter 19 of Agenda 21 is entitled „Environmentally Sound Management of Toxic Chemicals, including Prevention of Illegal International Traffic in Toxic and Dangerous Products“. A priorities for action plan to implement it has been adopted in 1994 in Stockholm, Sweden, at the occasion of the international conference of IFCS, the Intergovernmental Forum on Chemical Safety. Accordingly, the preparation of this National Profile must be regarded as a follow-up to Switzerland's having been amongst the countries agreeing upon Agenda 21, to its participating in IFCS, and to its intention to contribute to the establishment of an in-depth international overview.

The United Nations Institute for Training and Research (UNITAR) prepared, under the auspices of the IOMC, a guidance document for the preparation of national profiles. This guidance document has been developed in close collaboration with IFCS and reflects the following general considerations:

IOMC,
Inter-Organization programme for the sound Management of Chemicals,
is based upon a cooperative agreement among

⇒ **UNEP**, United Nations Environment Programme,
⇒ **UNIDO**, United Nations Industrial Development Organization,
⇒ **UNITAR**, United Nations Institute for Training and Research,
⇒ **ILO**, International Labour Office,
⇒ **FAO**, Food and Agriculture Organization of the United Nations,
⇒ **WHO**, World Health Organization, and
⇒ **OECD**, Organization for Economic Cooperation and Development.

- The sound management of chemicals has to consider their whole „life cycle“, i.e. their fate from importation or production via storage and transportation to exportation or distribution and use and finally to disposal or re-cycling.

- There are inherent risks and concerns connected with the management of chemicals, and these risks and concerns may become relevant at several or all the stages of the mentioned life cycle.

- There is probably in all countries a lack of an integrated approach when it comes to monitoring the fate of chemicals and to managing the respective risk throughout their life cycle. In other words: there are responsibility barriers and information gaps related to organizational structures and regulatory bound-

aries, and this holds regardless of the considered country's regulatory focus being on the risks (the chemicals) or on the elements to be protected (consumers, air, waters, soil, etc.).

- Therefore, it makes sense to compile a profile which addresses the nature and volume of the markets and industries concerned, the corresponding material fluxes, the priority concerns, the available legal instruments and non-regulatory mechanisms, the involved ministries, agencies, and other institutions along with their activities, the public awareness, and the whole respective infrastructure.

Correspondingly, the compilation of the National Profile is expected

- to build international confidence into Switzerland's being in control of its management of chemicals,
- to contribute to the reduction of international trade obstacles by facilitating coordination, and
- to add to the arsenal of international approaches to controlling the risks involved in the management of chemicals.

I-II NATIONAL INTEREST

Besides building international confidence, the National Profile shall

- serve the purpose of a review document for ministries and agencies involved in the handling of parts of the mentioned life cycle of chemicals,
- serve the same purpose for managers in trade and industries concerned with chemicals,
- foster the consideration among members of legislative and similar entities of the importance which chemicals might have in a priori non-chemical discussions,
- in this context raise the general public awareness,
- become a reference document addressing the attribution of responsibility and authority to either federal offices or to Cantons,
- facilitate the discussion amongst representatives of different governmental and non-governmental institutions of multi-facetted problems regarding the management of chemicals, and last but not least
- define the *status quo* and illustrate the questions which are being addressed at a turning point of Switzerland's history, i.e. at the edge of the implementation of the new, totally revised federal constitution which came into force on January 1st 2000.

The last above-mentioned point has led to the approach pursued in this National Profile in terms of dealing with the constitutional basis of the cited laws and ordinances: On the one hand, the Profile reflects the actual situation and the provisions which developed under the „old" and many times amended 1874-

constitution. On the other hand, it mentions some of the most important changes resulting from the fact that a totally revised constitution has been approved in the public vote of April 1999.

In conclusion, the National Profile is expected to contribute to the evolution and improvement of national regulations by identifying gaps and organizational bodies' interactions to be strengthened – and adherence to an international guideline in dealing with such matters is certainly advantageous in the sense that it facilitates international coordination.

I-III CHEMISTRY AND CHEMICALS – KEY ELEMENTS OF THE SWISS ECONOMY AND GENERAL WELFARE

National profiles have their main focus on the management of the risks as presented by the handling of chemicals in all the fields of the civilizations of our times. This should not make the reader forget, however, that chemistry, a comparatively young science, has been providing absolutely crucial benefits to modern societies. Thus, the use of chemicals is vital and indispensable not only in modern health-care, agriculture, production of consumer goods, design of durable packaging materials, surface protection, etc., but chemistry has also been building the basis for newer scientific developments, and neither molecular biology nor the understanding of nature's structures and survival mechanisms in general, the target of all environmental protection, would be conceivable without chemistry.

I-IV THE SWISS APPROACH TO THE NATIONAL PROFILE

UNITAR's guidance document foresees initiating the preparation of a National Profile by having a conference of all the concerned parties decide upon approaches to be pursued and priorities to be set. This might be ideal for less developed countries, but risks getting heavy for highly industrialized nations. Therefore, the Swiss Agency for the Environment, Forests and Landscape decided to first compile a draft on the basis of available information and bilateral discussions and to only then submit it to the interested parties' criticism. Implementing the decision has, after two meetings involving representatives of the organizational bodies cited in the impressum, led to the present edition which is hoped to be demonstrating the validity of the mentioned pragmatic approach.

Note on the Figures Presented, on Facts Cited, on References, on Abbreviations and on Terminology:

- The figures presented refer to 1996, if not otherwise indicated, and estimates are generally marked as such, while facts or judgements may reflect a more actual status (up to 1999).
- The profile presented is in essence based on the old constitution. But it may serve as point of reference in view of the new, **totally revised constitution in force since January 1st 2000**, and some of the most important new constitutional articles are actually mentioned – often along with their precursors.
- References and notes are found after chapter 14 (p. 111 ff.).
- Abbreviations are often explained, where they occur. They are, nevertheless, listed in the comprehensive Annex III (p. 143).
- There are no official and legally binding English translations of the Swiss laws and ordinances etc. But there are some non-official English editions of important documents like the Federal Constitution (the now replaced one with up-dates till 1997) available from EDMZ (Eidg. Drucksachen- und Materialzentrale, CH-3000 Bern). In addition, the Federal Chancellery recommends adherence to the terminology used in „The Swiss Confederation – a brief guide“. This recommendation was respected with very few exceptions, though the Profile has otherwise been written in American rather than British English.

II EXECUTIVE SUMMARY

II-I CONTENTS

This summary contains two mainly descriptive parts, II-II and II-III, and the more analytical part II-IV. The latter summarizes concerns and potential problems and addresses possible future developments.- The three parts are in essence reflecting the contents of the following chapters:

Part II-II: Chapters 1 and 2
Part II-III: Chapters 4 to 11
Part II-IV: Chapters 3 and 12 to 14.

II-II NATIONAL BACKGROUND AND ECONOMY

Key Figures

The following figures (referring to 1996) are characterizing the country:

- **Surface:** 41 284 km^2 .
- **Geographic regions and respective percentage of surface:** Jura 11.9%; Plateau 22.8%; Pre-Alps 16%; Alps 40.7%; South of the Alps 8.6%.
- **Population and languages:** 7.2 mio (~ 64% German, ~ 19% French, ~ 8% Italian, ~ 9% others)
- **Average age of population:** 39 years.
- **Working population and attribution to sectors:** Total 3.80 mio, thereof 41.2% women (4.6% of total in agriculture + forestry; 28.2% in industry incl. energy supply and construction, and 67.2% in services incl. trade and repair; unemployment rate 4.7%).
- **Gross domestic product (GDP) and contribution of sectors:**
  656.36 bio SFr. (total output at current prices, i.e. ~ 425 bio US$ at December 1999 exchange rate – thereof ~ 35% from industries incl. energy supply and construction and ~ 2% from agriculture) resp.
  363.82 bio SFr. (gross added value, i.e. so-called GDP at market price, ~ 235 bio US$ at December 1999 exchange rate – thereof estimated ~ 24% from industries without energy supply and construction and ~ 3% from agriculture).
- **Total imports and exports:** Imp. 96.7 bio SFr., Exp. 98.6 bio SFr.

Political System

Switzerland is a bicameral democratic confederation of states. It consists of 26 so-called Cantons. They form the country‘s administrative backbone and have their own governments and parliaments as well as significant independence. The Federal Constitution attributes given responsibilities to the Confederation and reserves others to the Cantons‘ authority. E.g., the Confederation is in charge of

- defence
- international relations (foreign affairs)
- control of imports and exports incl. taxation
- the Swiss Federal Railways (their status is now being changed).

In addition, the Confederation is in many instances defining the legislative principles and having the Cantons be implementing them to a major or minor degree. In these cases the Cantons are defining the rules in as far as this is foreseen by the federal legislation, but they may neither add to nor subtract from the defined principles.

The Cantons

The following table lists the Cantons in the rank-order of decreasing size – along with figures regarding population („industry" excludes construction and energy supply).

Canton (incl. abbreviation)		**Area** in **km²**	**Population in thousands**			
			Total	Working in the **3rd Sector**	Working in **Industry**	Working in **Agriculture**
Graubünden	GR	7105	189	52	10	10
Bern	BE	5841	951	215	79	46
Valais	VS	5213	269	59	18	15
Vaud	VD	2822	617	149	36	20
Ticino	TI	2738	301	86	18	4
St. Gallen	SG	1951	443	126	56	16
Zürich	ZH	1661	1194	367	97	16
Fribourg	FR	1591	229	41	18	12
Luzern	LU	1429	341	72	31	17
Aargau	AG	1396	529	94	62	14
Uri	UR	1058	35	6	3	2
Thurgau	TG	863	224	33	27	12
Schwyz	SZ	852	123	20	11	6
Jura	JU	839	68	11	10	4
Solothurn	SO	791	239	42	31	6
Neuchâtel	NE	717	166	34	21	4
Glarus	GL	681	39	6	5	2
Basel Landschaft	BL	518	252	44	28	4
Obwalden	OW	481	31	6	3	2
Schaffhausen	SH	298	74	13	10	3
Genève	GE	246	396	136	22	3
Appenzell A.Rh.	AR	243	54	8	5	2
Nidwalden	NW	242	36	7	3	2
Zug	ZG	207	93	27	11	2
Appenzell I.Rh.	AI	173	14	2	1	1
Basel Stadt	BS	37	199	77	30	0

The Cantons are the political units which have historically built the Confederation. They are in many cases covering parts of more than one of the mentioned geographic regions, and they differ strongly with regard to size and number of inhabitants. A **map** showing them is found on page 25.

Agriculture

In Switzerland 38% of the country's surface are covered by grassland or arable land. Alpine pastures contribute a third to this area and farmland two thirds. Furthermore, about 30% of the total surface are covered by forests and about 20% by non-productive vegetation or no vegetation at all. This means that a relatively small percentage of the total surface is used as farmland which is intensively cultivated. Livestock consists primarily of 1.7 mio cattle, 1.4 mio pigs, and 0.4 mio sheep. Meat production covers 80% of the country's consumption, and milk products even reach 110%, while the respective figure for plant products is about 45%. Thus, milk products and meat represent Switzerland's most important agricultural output. The agricultural foreign trade balance is negative overall.

Although livestock maintenance and meat production keep the first place in Swiss agriculture, plant production plays an essential role. The new agricultural law put into force in 1998 requires the respecting of economic as well as ecological principles. The former regard the quantity and quality of the food produced, and the latter concern the maintenance of the natural living environment and the cultivated land.

Reaching the mentioned legal goal requires a high level of competence, productivity, predictable yields, and economic efficiency in the production of plants. In addition, it requires the application of pesticides. The latter are intentionally applied against living organisms such as pests and weeds. Consequently, they also present a risk potential. The respective risk management includes the requirement of approval of plant protection products by the Swiss registration procedure. Strict legal principles ensure clear effectiveness against the target organism(s) along with the absence of a relevant risk for the environment or man. Finally, farmers are getting financial incentives for the application of ecological principles in their production, which is fostering the responsible use of pesticides as well as sustainability in agriculture.

Service Sector

The service sector is the largest in terms of employees or business owners (~ 67%), and it is continuously growing. This fact is often forgotten in discussions of technical matters or environmental impact. But it is not irrelevant at all for the purpose of this report as it includes trade, transportation, and repair (of automobiles etc.) as well as, e.g., hospitals, service laboratories, and research institutes – and it creates a very significant part of the total demand of so-called consumer goods.

Industries Producing Goods

The list of Cantons on page 12 illustrates the differences regarding their level of industrialization. Here, it shall be added that there are local concentrations of some industries: chemicals in the two Basels, watches in the western parts of the country, and textiles in the eastern and southern parts. The remaining industries are fairly well distributed over the country, i.e. mainly the Plateau.

The main industries are in the following table listed according to the rank-order regarding numbers of employees – along with the estimated total yearly output in bio SFr. (together 31% of the GDP of 656 bio SFr.).

Industry	**Employees in 1000's**	**Output in bio SFr.**
Electronics, instruments, watches	133.8	together
Machinery, vehicles	126.7	~ 72
Refining metals, metallic products	105.5	~ 22
Paper, printed matters	77.3	~ 15
Food, tobacco	65.6	~ 30
Chemicals, incl. pharmaceuticals	65.4	~ 42
Wood, incl. furniture	41.9	~ 11
Textiles, incl. clothing	30.4	~ 5
Leather, rubber, plastics	27.0	~ 6

Industrial Chemicals – Imports, Production, Use and Exports

The Swiss industry focusses to a large extent on high value-added products. This should result in relatively low tonnages of imports of industrial raw materials. But Switzerland has no (no exploitable?) fossile fuels, while having a high demand – for traffic, heating, and industry. Thus, there is a very strong tonnage excess of chemical imports over exports (17.6 versus 1.5 mio tons). The main product types are:

Type of product	**Imports (mio tons)**	**Exports (mio tons)**
Fossile fuels (incl. 2.0 mio tons of gas)	13.9	-------
Organic raw materials	0.96	0.17
Unformed plastics	0.76	0.33
Inorganic raw materials	0.43	0.21
Fertilizers and pesticides	0.27	0.11

The fact that, nevertheless, the chemical trade balance in terms of value is strongly positive (imports 16.9 bio SFr. incl. fuels; exports 26.0 bio SFr.) illustrates the strong added value-orientation of the Swiss chemical industry and gives an idea of the number of chemical transformations which have to be carried out in order to achieve the mentioned result. The latter is getting even more impressive, if one considers the fact that some of the non-fuel chemical imports regard raw materials and processing

aids for other industries. The respective figure has not been determined, but it cannot be negligible in comparison to the following total yearly usages:

Fertilizers	~ 400 000 tons
Pesticides	~ 1850 tons
Soaps and detergents	~ 150 000 tons

Finally, the segments of the Swiss chemical industry shall be mentioned in order of decreasing importance (regarding turnover):

Pharmaceuticals (incl. vitamins and diagnostics) > Raw Materials and Intermediates > Agrochemicals ≈ Dyes and Pigments > Unformed Plastics > Flavor and Fragrance Materials > smaller segments like glues or varnishes.

Wastes and Emissions

The country's generation of greenhouse gases and special wastes reached peak values in the 1980's and started to decrease in the 1990's – especially thanks to a somewhat weak economic development, to strong efforts of industry, and to tighter controls. Exceptions are non-biogenic CO_2 and special household garbage. Still, the strong increase of the former between 1960 (~ 20 mio tons) and 1980 (~ 43 mio tons) has been slowed down dramatically (~ 45 mio tons in 1995); and the increase of special household garbage is compensated for by a reversed trend regarding mixed garbage.- Alltogether, industry (excl. transportation) contributes ~ 15% to the production of greenhouse gases and the major part of the ~ 860 000 tons of special waste generated (regards 1995). About 14% of the latter are exported.

II-III MANAGEMENT OF CHEMICALS AND LEGAL PROVISIONS

Legal Principles regarding Chemicals

Welfare of the citizens is one of the main purposes of the (old and new) Swiss Federal Constitution (Art. 2). This is implicitely addressing risks and concerns. However, the constitution is not structured according to risks, but rather according to targets and values to be protected, i.a. the sustainability explicitely mentioned in the new constitutional Art. 2. Still, there is mention of risks, and even the term „chemicals" appears in the new constitution in force since January 1st 2000. In addition, there are actually valid laws addressing „poisons" (toxic substances) and the implicitely related protection of the environment and of human health, and there are laws referring to types of products, like consumer products and food, or to activities, like agriculture and work in industry and trade, respectively. Chemicals are playing a role in all these cases, and the new constitutional article on agriculture (Art. 104) requires a sustainability-conscious use of chemicals, while the new Art. 118 summons the diligent use of chemicals in view of the protection of health.

Consequently, provisions regarding the management of chemicals are laid down in a multitude of laws and derived ordinances. This had to be considered in compiling the present National Profile, and the resulting overview (Annex I) might very well become its most useful aspect.

Important Laws and Ordinances

Selected important laws and ordinances are in the following table ordered according to their main focus of protection, and the mainly concerned aspects of the „chemicals life cycle“ are used as a secondary ordering principle. A more comprehensive list is found in Annex I and commented on in chapters 4 and 5.- The abbreviations used to indicate the concerned aspects of the „life cycle“ are

I for Imports, **E** for Exports, **P** for Production, **S** for Storage and Transportation, **U** for Use, **D** for Distribution, and **R** for Recycling and Disposal.

Main Focus of Protection	**Aspects of „Life Cycle“**	**Means**	**Laws and Ordinances incl. SR-numbers**
Peace	E	Non-proliferation and no exports facilitating prod. of chem. weapons	F.L. on Control of Dual-Use Goods, 946.202; Ord. on Control of Dual-Use Goods, 946.202.1
Peace	E	Non-proliferation	F.L. on Control of War Material,514.51 with Ord. 514.511
National supplies	I, P, S, D	Warranting imports and defining stocks and/or authority	F.L. on National Supplies, 531; Intercantonal Agr. on Salt, 691
Free trade and entrepre-neurship	I, E	Reducing negative impact of technical trade barriers	F.L. on Technical Trade Barriers, 946.51
Justice	All	Holding owners/pro-ducers liable	F.L. on Product Liability, 221.112.944; OR Art. 55; F.L. on Environmental Protection, 814.01, Art. 2 & 59a
Truthful information	All	Setting targets, financial support	F.L. on Information of Consumers, 944.0
Objectivity	All	Setting standards	F.L. on Measuring, 941.20; Ord. on Accreditation and Designation, 946.512; F.L. on Pharmacopoeia, 812.211
Health-related profession-alism	P, D, U, S	Maintaining educational standards	General Ord. on Examinations in Medicinal Professions, 811.112.1; Ord. on Federal Diploma of Food Chemists, 817.92; Dept. Ord.s on Examinations Required to Handle Toxic Substances (814.832.5..)

Continuation of table:

Main Focus of Protection	Aspects of „Life Cycle“	Means	Laws and Ordinances incl. SR-numbers
Environment-related professionalism	P, U, S	Maintaining educational standard	Dept. Ord.s on Professional Approval to Use Pesticides etc., 814.013.5..
Health	I, E	Restrictions, control	Ord. on Precursors of Narcotics and Psychotropics, 812.121.3; F.L. on Food and Consumer Prod., 817.0
Health	D, U	Limiting concentrations, control, positive lists	F.L. on Food and Consumer Prod. 817.0; Ord.s on Food Additives resp. Contaminants, 817.021.22 resp. 23, on Packaging Materials, 817.041.1, and on Cosmetics, 817.042.1
Health	All	Control, registration or notification, restrictions	F.L. on Toxic Substances, 813.0; Ord. on Toxic Substances, 813.01; Ord. on Forbidden Toxic Substances, 813.39; Ord. on Material Safety Data Sheets for Toxic and Environmentally Hazardous Substances, 813.013.4
Health	D, U	Control, registration, restrictions, (taxation)	Intercantonal Agreement on Drug Control, 812.101; F.L. on Narcotics and Psychotropic Substances, 812.121; F.Dec. on Control of Blood, Blood Prod. and Transplantates, 818.111; F.L. on Alcohol, 680
Health	P	Insurance of workers, max. work-place conc.	F.L. on Insurance against Accidents, 832.20; Ord. on Prevention of Accidents and Occupational Diseases, 832.30
Health	P	Safety measures	F.L. on Work in Industry and Trade, 822.11
Health / Environment in the light of agricult.	U	Control, positive lists, due diligence	F.L. on Agriculture, SR 910.1; Ord.s on Plant Treatment Products resp. Fertilizers, 916.161 resp. 916.171
Environment	All	Definig targets resp. classes of substances, restrictions, registration / notific.	F.L. on Environmental Protection, 814.01; Ord. on Environmentally Hazardous Substances, 814.013
Environment	P, U, D, S, R	Limiting concentrations, defining measures	Ord. on Air Pollution Control, 814.318.142.1; Ord. on Soil Pollutants, 814.12; F.L. on Protection of Waters, 814.20; Ord. on Protection of Waters 814.201; Ord. on Protection of Waters Against Hazardous Liquids, 814.202
Environment	P, S, R	Defining measures	Ord. on Environmental Impact Assessment, 814.011; Ord. on Protection Against Major Accidents, 814.012

Continuation of table:

Main Focus of Protection	Aspects of „Life Cycle“	Means	Laws and Ordinances incl. SR-numbers
Environment	S	Defining measures	Ords. On Transporting Dangerous Goods (Streets, 741.621; Railways, 742.401.6; Pipelines, 746.1; Ships, e.g. 747.224.141; Air, 748.411)
Environment	R	Control, limits, measures	Ord.s on Waste Water Discharge, Movements of Special Waste, Waste (814.225.21, 814.610 & 814.015); Ord.s on Recycling, 814.016 & 017

Regulated Chemicals

Chemicals are regulated as **toxic substances** (poisons) and / or as **products for defined uses** and / or as **environmentally relevant (hazardous) products**.

All **toxic substances** to be commercialized as such or as components of products require classification and permission regarding commercial distribution. This corresponds in essence to a registration.- **Defined uses** requiring permission, i.e. registration, concern on the one hand products with an impact upon health, whereby there are specific groups like drugs or food-additives. On the other hand, the bulk of the regulated **environmentally relevant products** are defined through their use. Such products are especially anti-foulings, wood protectants, and some pesticides. They are regulated along with specific classes of environmentally hazardous substances, like halogenated or mercury-containing compounds, by the Swiss Agency for the Environment, Forests and Landscape. In addition, there are products for agricultural use and especially pesticides, which are regulated by the Federal Office for Agriculture and according to the respective law, and there are the disinfectants which are controlled according to the Federal Law on Epidemic Diseases.

An important point has to be added here. It regards the introduction of new products. Such introductions (i.e. commercial distribution resulting in environmental or health-related impact) are always linked to a double duty of producers or distributors:

- They have to live-up to the due diligence requirement (self-control!), and
- they have to register as (potentially) toxic all the new substances which are meant to become commercial end-products or part thereof and aren't covered by the legislation on drugs, food, or cosmetics (the final judgement of a new substance's toxicity is not left to the producer's or distributor's discretion).

Finally, there are „new products“ exclusively containing known or listed components (existing substances), which require notification rather than registration, but this is

always including the producers' duty to communicate new relevant findings to the competent authorities (cp. in the above table the entries „health – all aspects of life cycle" and „environment – all aspects of life cycle" in view of the most important respective laws and ordinances).

Regulations addressed no more than implicitely in the preceding paragraph regard imports and exports as cited in the table above. These regulations may cover products which are forbidden on the grounds of international agreements and may be an integral part of health- or environment-related ordinances (e.g. coolants depleting the ozone layer – Vienna Convention of 1985 and Montreal Protocol of 1987 with amendments), or they may, e.g., cover strategically relevant intermediates (cp. „peace" mentioned in the table as a main focus of protection).

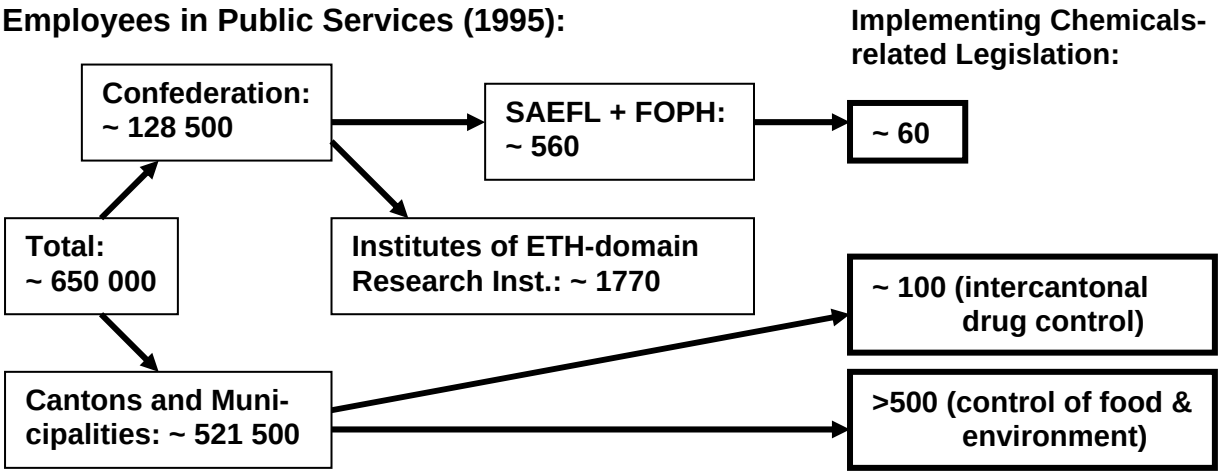
Roles of the Confederation, the Cantons and the Private Sector

The Confederation's legislative role is dominant with regard to environment-related matters and significant with regard to health-related aspects of the management of chemicals. Accordingly, the Cantons have a certain legislative power regarding public health. In addition, they are in a concerted effort regulating classical drugs (through a so-called concordate including all of them), while vaccines and blood-derived medicines are under federal authority. Finally, the mandatory accident insurance of workers and employees is organized according to federal legislation, and the National Accident Insurance Fund (Suva) is managed in a joint effort of governmental and private bodies. Otherwise, Switzerland has a private, though tightly regulated health insurance system.

The laws and ordinances regarding the management of chemicals are implemented in a shared effort of the Confederation and the Cantons. The former is in many cases in charge of the coordination and in addition taking care of the customs control, while the latter inspect industry and trade within their borders. These efforts are supported by the private sector which is charged with significant due diligence requirements and which facilitates implementation through the activity of individual companies, of SSCI, the Swiss Society of Chemical Industries, and of professional as well as environment- or consumer-oriented organizations. All these bodies are, by the way, addressed early-on in hearings on new chemicals-related laws.

The exact number of employees charged with all the aspects of the public management of chemicals has not been determined, but it represents no more than a small fraction of the about 650 000 (incl. part-time) employed at all levels of public services. Thus, there is a certain indirect involvement of staff in research and ETH-annex institutes like the ones mentioned in the figure below; and the list shown is not considering all the potentially relevant institutions. Known, however, is the fraction of the staff involved directly in the implementation of chemicals-related legislation and belonging to the federal offices (agencies) charged with health (FOPH) and environmental matters (SAEFL). They are dealing with notifications and registrations, with permits, with risk assessments, and with the control of the market, and they are

to some extent supporting the cantonal employees and coordinating their efforts.- Here, it has to be added that the totals in the figure concern 1995 and include railways, mail, and telephone services at the federal level.



Education, Research, Professional Standards and Data Management

There are 9 Swiss universities and several technical colleges with chemistry faculties. Two of the former are ETH's (Federal Institutes of Technology), and the larger one of the two (Zürich) holds about 400 chemistry positions (excluding students, but including non-permanent National Research Foundation programs and the like). In addition, the ETH's have Food and Agriculture-, Construction and Environment-, and Process Engineering-Departments, and it goes without saying that their level of research, instrumentation, and expertise enjoys first rate world-wide reputation. This is setting the national standard, and the professional education at all levels as well as the working standard in governmental and industrial labs are taking it as the yard stick and are generally not far behind. The latter holds especially for the large multinational pharmaceutical groups headquartered in Switzerland, which have a similar reputation, of course, and which spend more than 10% of their turnover on R&D.

Data management is at a similar technical level, though there are two types of limitations of the accessibility of public data on chemicals management. The first concerns the confidentiality of information about the know-how-protected processes and business of individual companies, and the second regards the fact that some of the software addressing governmental files is not yet at the desirable level of user-friendliness and flexibility in terms of access-control. But this kind of situations is encountered in most modern states holding large files which have been supplemented over decades (like, e.g., the complete Swiss file of the more than 200 000 commercial products or the about 150 000 with components belonging to the poison classes 1 – 5).

International Linkages

Switzerland belongs neither to the UN nor to the EU. Nevertheless, it plays an active role in the UN Commission for Sustainable Development (CSD), the UN Environment Program (UNEP), and the International Program on Chemical Safety (IPCS) which is run under the auspices of UNEP, the World Health Organization (WHO), and the International Labour Organization (ILO). In addition, Switzerland is OECD-member and heavily involved in bilateral negotiations with EU – and the combined EU-countries are actually its number one foreign trade partner. Therefore, the private sector is to a large extent living up to EU-regulations on a traditional and voluntary basis or on the grounds of results of the mentioned negotiations.

II-IV CONCERNS, POTENTIAL PROBLEMS AND FUTURE DEVELOPMENTS

Overall, Switzerland has limited concerns regarding its management of chemicals. But it faces potential problems linked to its intense industrial, agricultural, and residential exploitation of the limited land available outside of the alpine region, its high costs of labor and land, its narrow network of communications (railroads and streets), and its far-reaching democratic rights. This results in a multitude of interactions and interdependences and creates the need of a sophisticated risk management (implementation of the Ordinance on Protection Against Major Accidents). This risk management profits from the flexibility of the federalistic political structure, but the latter is complicating things as well.

The result is a high public awareness of environmental matters – may be with a little too much of a local view and with a certain suspicion concerning the complex solutions which are non-transparent for non-technical people.- Furthermore, there is certainly public awareness of the important economic role the country's chemical industry is playing, but there is possibly not enough of an understanding for this industry's interest in international harmonization. Nevertheless, Switzerland has signed many international agreements and has high standards in terms of implementing the rules once accepted.

Thus, there is no general problem of lack of agreement about major environmental issues like greenhouse gases, ozone-depleting products, historical dumping sites, or genetic variability, but there are certainly disagreements regarding the measures to be taken, their proportionality, the priorities, and the financing approaches to be pursued. This situation is accentuated by the country's public debt and by the differing credos favoring, e.g., centralization or decentralization and tight public control or free and responsible entrepreneurship, respectively.

The mentioned differences of political attitudes are here to stay, but the country must succeed in further strengthening its scientists' inter-disciplinary discussion of issues

regarding the environment and the management of chemicals, and it must succeed in strengthening the public confidence in the resulting scientific common denominators. Important savings and avoidance of undue investments should result from such an approach – and possibly an increased public awareness of the fact that an effective environmental policy and management of chemicals depend on the future efforts to foster the corresponding international collaboration.

This summarizing assessment is in line with the „Environmental Performance Review of Switzerland“ recently published by OECD [33], which pays respect to the achievements of the past and which, at the same time, underlines the need to consequently proceed towards sustainability at all the levels concerned.

CHAPTER 1: NATIONAL BACKGROUND INFORMATION

Switzerland has no access to the seas of this world, but the rivers originating in its Alps become streams, travel through many countries, and end up in the Northern Atlantic, the Mediterranean, or the Black Sea. These waters have become a source of wealth by providing many opportunities for hydroelectric power stations as well as logical sites for the development of industrial agglomerations - and the Alps which used to be dividing Europe have more and more been channelling and attracting traffic. This special situation has contributed to Switzerland's becoming an independent and stable multi-lingual and multi-cultural federal nation with a pronounced democracy – and it is defining a special responsibility in view of international collaboration and protection of the environment.

1.1 Physical and Demographic Context [1]

- Size of the Country: **41 284 km^2 .**
- Form of Government: **Democracy, neutral bicameral federal nation.**
- Official Languages: **German** (63.6%), **French** (19.2%), **Italian** (7.6%), **Roman** (0.6%),
  (other non-official foreign languages: 8.9%).
- Local Languages: **Dialects** of the official languages.
- Total Population: **7.2 Mio.**
- Urban Population: **68%** living in agglomerations or cities with more than 10 000 inhabitants;
  the respective average population density in urban regions is 689 inhabitants/km^2;
  33% living in the five agglomerations with more than 200 000 inhabitants (Zürich, Genève, Basel, Bern, and Lausanne in order of decreasing size).
  The definition of agglomeration includes i.a. continuity of coverage by buildings and commuting.
- Rural Population: **32%** living outside of the agglomerations or cities with more than 10 000 inhabitants;
  the respective average population density in rural regions is 69.4 inhabitants/km^2.

- Average Age of the Population: **39.0 years.**

- Population of Working Age (> 15 and < 65): **68.1%, i.e. 4.9 Mio.**

- Birth Rate: **11.7 born alive per year and 1000 inhabitants.**

- Life Expectancy: **Male: at birth → 75.3, at age 65 → 16.1 years**
  Female: at birth → 81.7, at age 65 → 20.2 years.

- Literacy Rate **> 99%**

- Average Education Level of Population: **20% obligatory school** (primary level)
  58% secondary school (secondary level, including professional schools)
  12% higher education (tertiary level, excluding university)
  10% university.

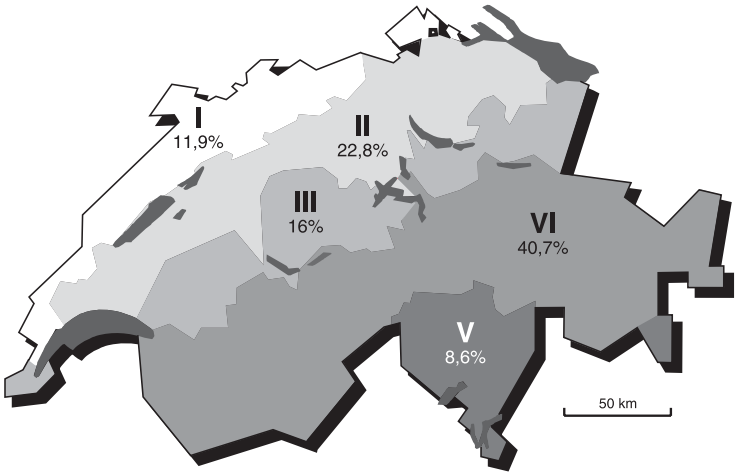
- Unemployment rate **4.7%** (below 3% in August 1999).

- % Women Employed Outside the Home: **43.5%.**

1.2 Geographic and Political Structure

Switzerland is divided into five main geographic **regions**: Jura (I, 11.9%), Plateau (II, German: Mittelland – 22.8%), Pre-Alps (III, 16%), Alps (IV, 40.7%), and South of the Alps (V, 8.6%). That means that 78.2% of the country's total surface are covered by mountain-chains and the relatively narrow valleys between them. Furthermore, the surface is covered as follows [1]:

The Geographic Regions [2]

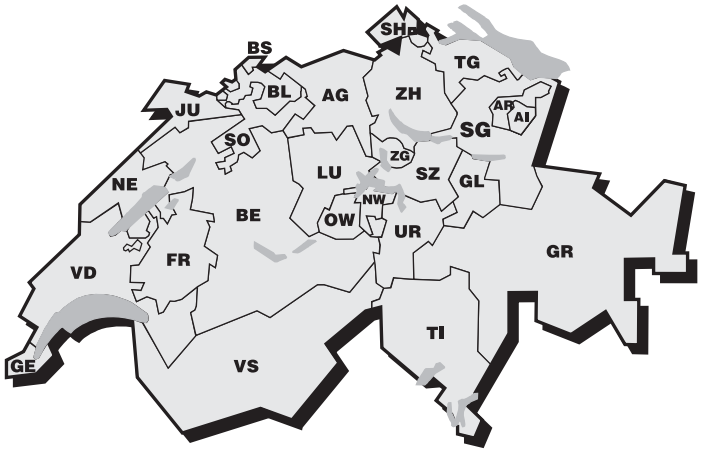


- 37.9% by farm- and grassland,
- 30.4% by forests and forest-like vegetation,
- 21.3% by non-productive vegetation or no vegetation at all,
- 4.2% by water,
- 3.5% by building zones, and
- 2.0% by streets and railroads.

There are no larger regions populated by specific ethnic groups, but **languages** are playing an important role. Thus, the German speaking population is living in the eastern and central parts of the Jura, the Plateau, the Pre-Alps, and the Alps, the French speaking population in the corresponding western parts, and the Italian and Roman speaking population mainly in the South of the Alps and to some extent in the Alps.

Politically Switzerland consists of 26 Cantons whereof 6 are so-called Half-cantons with somewhat less of a say in the federation. All these Cantons have their own legislative, executive, and legal authority, all are (with a slight simplification) based on municipalities as the next lower administrative level, and all rely on the principle of the so-called direct democracy, which also holds with regard to federal matters. Thus, Swiss citizens are not only paying taxes and electing representatives, but also voting on legislative changes or factual decisions at three levels, i.e. at the federal level, in one of the 26 Cantons, and in one of about 2900 municipalities [1].

The 26 Cantons



Compare **Table 1.C**, p. 32, concerning the meaning of the abbreviations used.

The Swiss **Constitution** [3] is basically attributing specific responsibilities to the federal level and others to the Cantons which are sovereign political entities. Nevertheless, it is one of the main characteristics of confederations like Switzerland that the confederation may set law with direct impact upon citizens or inhabitants, respectively, and that in principle this law always has precedence over the one of the member states (the Cantons).

Still, Switzerland is not a very centralized country, because federal legislation is often just defining the basic rules and having the Cantons be in charge of their implementation. This may have the advantage of allowing for individually adapted solutions and may have the drawback here or there of lack of coherence and of quite some complexity.

The mentioned division of responsibilities amongst the federal and the cantonal level is reflected, i.a., in the legislation regarding human **health** and the **environment**, which is very much in the focus of this National Profile. Important is certainly Art. 74 of the new constitution (replacing in essence Art. 24$^{sept.}$ of its precursor). It also concerns human health, in spite of its carrying the title „environmental protection", and it reads:

(1) The Confederation issues regulations to protect human beings and their natural environment against harmful or annoying effects.
(2) It makes provision for avoiding such effects. The costs generated by the (effort of) avoidance or elimination (of such effects) have to be borne by those who (originally) caused them.
(3) The Cantons have the authority and the responsibility to implement and enforce the laws, in as far as this is not by law reserved to the Confederation.

The Federal Law on Environmental Protection has at the time been issued on the basis of this cited federal authority, which has left the Cantons with comparatively little independent legislative power regarding issues like environmentally hazardous substances or air pollution control. Still, they are to a large extent in charge of the implementation, and indeed, this has significant importance.

Of course, the cited constitutional article is by no means the only one combining provisions which, in the broadest sense, address human health as well as the environment. At the contrary, Art. 73 – 80 of the new constitution (the subchapter on environment and general zoning plans) contain many of those „dual use provisions", and all of them reserve the Confederation's right to define corresponding principles which are valid for the Cantons and are restricting their legislative freedom.

„Health" and „environment" are, nevertheless, addressing separable aspects, and one illustration of that fact is the existence of separate federal offices or agencies in charge of health and of the environment, respectively, i.e. the Federal Office for Public Health and the Swiss Agency for the Environment, Forests and Landscape [4]. Another illustration of the mentioned fact results from a look at Art. 108 – 120 (the subchapter on topics like housing, work, social security, and health), which now groups issues that were not presented together in old constitution (e.g. Art. 24^{novies} on protection of the genome, Art. 34bis on insurance against accidents and diseases, and Art. 69 on contageous diseases).

Again, these articles charge the Confederation with significant authority with regard to the setting of generally binding principles, and this includes the diligent use of chemicals in view of the protection of human health (Art. 118). But the Cantons are

left with much more than negligible legislative freedom in terms of setting health-related norms.

Here, it shall be added that the above remarks on the legal situation regarding health and environmental protection are neither comprehensive in view of the complexity of the fields nor complete with regard to existing approaches to division of powers [5].

E.g., there is the additional possibility of treaties among several Cantons jointly deciding to take care of given tasks. Mostly, these are so-called concordates which *(i.a.)* may only be formed, if not infringing with federal legislation. The information in the frame, to which the reader shall now be referred, is actually addressing IKS (Interkantonale Kontrollstelle = Intercantonal Office for the Control of Medicines), i.e. one such case of a treaty involving all the 26 Cantons [6].

Health and Environment: Role of the Confederation, the Cantons and the Municipalities

	Federal	**Joint Cantons (some or all)**	**Cantons**	**Municip.**
HEALTH:				
Legislation	●●●	●	●●●	
Execution	●●	●●	●●●●●	●●●●
ENVIRONMENT:				
Legislation	●●●●●●		●	
Execution	●●●	●	●●●●	●●●●●

Remark: Social security is disregarded in the above representation, while „health“ includes hospital care. The „legislative“ role of the joint Cantons regarding health concerns the Intercantonal Office for the Control of Medicines, the „federal drug agency“ which is based on a treaty signed in 1971. – The **dots** visualize the relative weight of the respective domains.

1.3 Industrial, Agricultural and Transportation Sectors

1.3.1 Overview

Slightly less than a fourth of the total working population belongs to the combined Swiss industrial and agricultural sectors generating material products. The former makes an above average contribution to the gross domestic product and to the country's positive trade balance, whereas the opposite is true for the latter [1, 7]. The reason is that Switzerland produces mainly high value industrial specialties and that it still has a large number of small to very small farms. – The trend towards

specialization in farming is a logical consequence. It is illustrated by the increasing production of so-called agricultural bio-products and by the increasing number of farms headed by farmers who went to professional schools [1]. The result is an increasing awareness of delicate ecological interdependences and an increasing sophistication in selectively exploiting the benefits of pesticides and chemical fertilization.

Table 1.A: Overview of the Industrial and Agricultural Sectors [1, 8, 9 - 11]

Sector	Contribution to the Gross Domestic Product	Number of Employees (Mio.)	Major Products
Industrial/ Manufacturing Sector	24 %	0.73	- Machinery & metallic products - Fine mechanics, electr. & optical instruments - Paper & graphic products - Food - Chemical products
Mining and Extraction	< 1%	0.006	- Cement
Agricultural Sector	2.6 %	0.12 – 0.22	- Milk - Cereals (wheat, corn) - Meat (porc, beef) - Potatoes & Sugar-beets - Fruits & berries - Vegetables
Total	27 %	0.9	

Remarks: The manufacturing sector is excluding power generation and construction as well as, e.g., automobile repair and the like. „Employees“ in the Agricultural Sector includes owners. The smaller figure given in this case excludes part-time employees, while the larger one includes them. The percentages regarding the GDP-contributions are best estimates and refer to the „GDP at market value“ (363.8 bio SFr.).

Table 1.B: Structure of the Agricultural and Industrial / Manufacturing Sector [1]

	Micro Farms / Facilities	Small Farms / Facilities/	Medium Farms / Facilities	Large Farms / Facilities
Agricultural Sector	19 093	43 025	16 411	950
Industrial / Manufacturing Sector	32 644	7 696	756	372
Total	51 737	50 721	17 167	1 322

Remark: Farms are classified according to productive area, while industrial facilities are classified according to number of employees. The definitions used are explained on the following page.

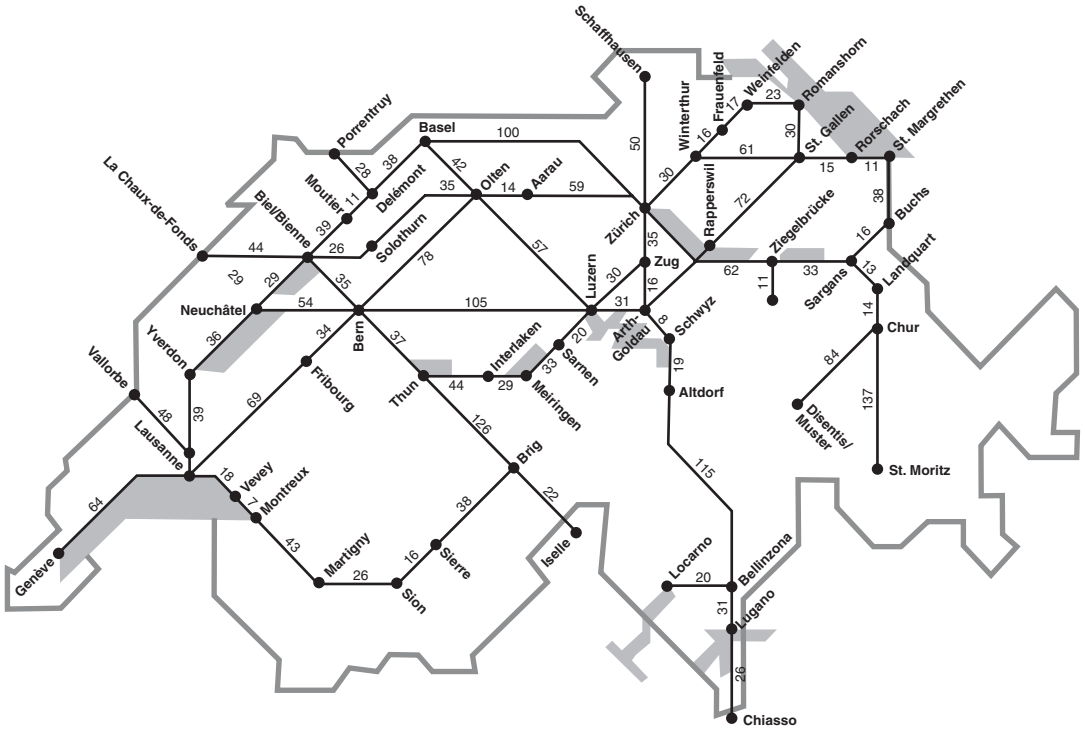
Micro:	< 0.05 km^2 (farms),	< 10 employees (facilities)
Small:	0.05 – 0.2 km^2 (farms),	10 – 99 employees (facilities)
Medium:	0.201 – 0.5 km^2 (farms),	100 – 249 employees (facilities)
Large:	> 0.5 km^2 (farms),	> 249 employees (facilities).

In addition, agricultural figures refer to 1996 and industrial figures to 1995. Therefore, the „total“ obtained by just adding the two figures must be interpreted with care.

The last point to be addressed in this overview regards communications, i.e. traffic and transportation. It is of special importance in view of Switzerland's geographic situation in the heart of Europe, of its tectonic structure, and of its exceptionally dense network of railroads. The relative importance of the latter has been decreasing over the past 20 years, but some 38% of all the commercial goods transported in Switzerland were still travelling by train in 1995. This amounted to about 8000 mio metric kilometer-tons.

The following figure gives an impression of the Swiss Federal Railways (SBB = Schweizerische Bundesbahnen). It includes distances (approximate km-figures), and it disregards the minor lines.

Network of the Swiss Federal Railways

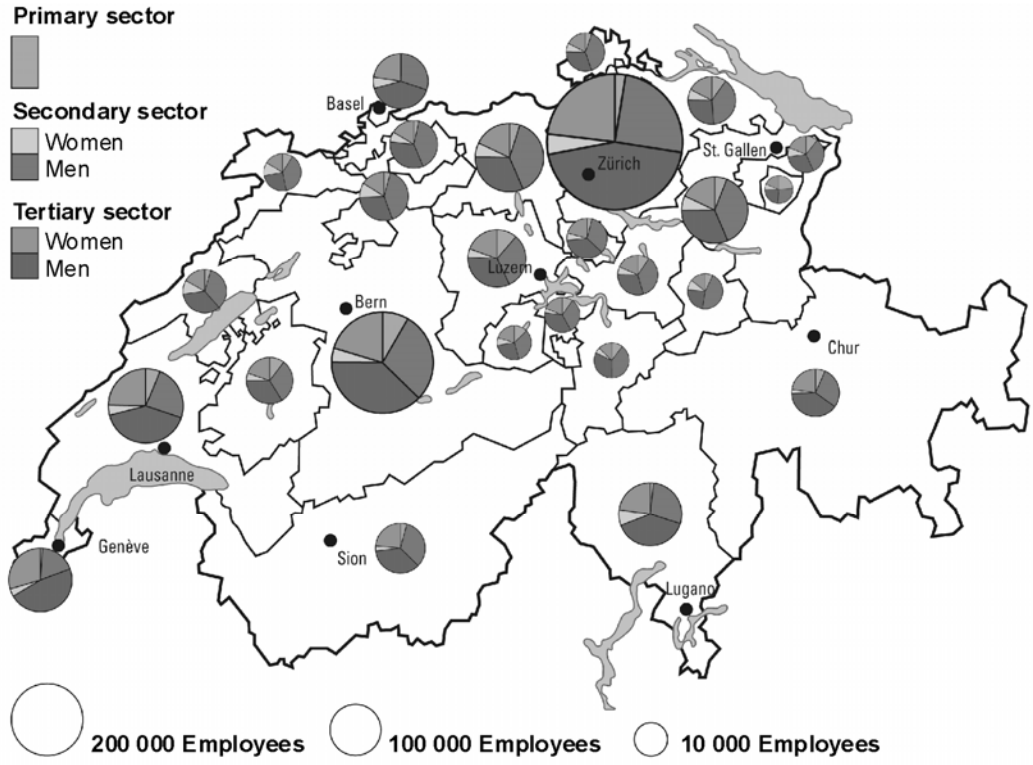


1.3.2 The Cantons

Switzerland has no political structure reflecting the geographic regions mentioned in chapter 1.2. Its Cantons are too important as cultural and political entities, and quite a number of them are covering parts of more than one of these types of landscape. Nevertheless, this subchapter shall address the role of the regions as well.

The Cantons differ strongly in terms of size and economic structure and weight. This is illustrated by the map on this page and by tables 1.C to 1.E.

The Cantons' Total Employment of Men and Women in the Three Economic Sectors [12]



The map illustrates the economic importance of the so-called sectors I – III (I = agriculture, II = industry, and III = services). Here, power generation and construction are included in the industrial sector (2.2% and 32%, respectively, of its total employment in 1995). Clockwise from the top, the pie charts visualize men and women in sector I, men in sectors II and III, and women in sectors II and III. Their size is proportional to the total number of employees in the three sectors.- The map also shows some of the cantonal capitals. Zürich (name of the Canton and its capital) is the largest Canton in terms of employment. It has about 720 000 people working in the three sectors. Bern (also name of the Canton and its capital which is capital of Switzerland at the same time) is the second largest with about 510 000, and Appenzell Innerrhoden is the smallest with about 6400.

Tables 1.C to 1.E on the subsequent pages are organized according to Cantons, but consideration of the **regions** [2] mentioned in the second column of tables 1.C and 1.E allows to conclude that the Plateau , i.e. only 23% of the surface, contributes about half the agricultural output and homes about half the industrial facilities and half the population. A comparatively high density of industrial facilities is characterizing the Jura (close to 20% on 12% of the surface). Here, one finds the bulk of the chemical industry which is located in the Basel area.

Regarding **historical development** there still is in the Jura a significant strength of the industry producing watches, which once dominated this region and expanded mainly over the French speaking parts of the country. The German speaking Cantons, however, experienced a more pronounced growth of the industries refining and treating metals or making machinery incl. vehicles. In addition, the German speaking eastern and Italian speaking southern parts of the country are still showing some of the very significant traditional strength of their textiles industry. Finally, the role of agriculture has been continuously declining over the years – from about 20% of total employment after World War II to less than 6% today [1].

Bern makes with about 19% the largest cantonal contribution to the country's total **agricultural GDP**, and the Canton de Vaud, the second largest in this respect, contributes about half as much. This may be concluded from considering the employment figures (cp. table 1.C on the following page) as well as the size and type of agricultural surface and production (cp. table 1.D on page 33) [13]. The latter, i.e. especially the size of livestock per area, is also playing a role with regard to the management of chemicals. It has a significant impact upon the use of chemical fertilizers and pesticides. Finally, the alpine pastures are, of course, less heavily exploitable and exploited than the remainings of the agricultural surface.

The **industrial employment** figures in table 1.E (page 34) concern the year 1995 and refer to numbers of full-time employees [1, 15]. They represent 88.7% of the respective total.- The industries shown in the table are the largest four or five, respectively, of each Canton. A fifth one is mentioned, where the rank-order of only four would have created an accidental picture. „Instruments", by the way, includes watch making, „machinery" includes vehicles, and „wood" includes furniture. Construction, working of gravel-pits, and energy supply are not considered; and the latter is still a source of wealth for the alpine Cantons with their hydro-electric power stations.

Commuting across cantonal borders as well as differing importance of the services sector are in addition to regional characteristics the main reasons for the distinct differences found when expressing the Cantons' numbers of industrial employees as percentage of the permanently resident population. Thus, table 1.E (page 34) leads to significant conclusions in terms of industry-related traffic and main transported goods. It is, together with the map on the preceding page and with tables 1.C and 1.D below, forming a basis for analyzing a multitude of questions – and aspects of chemical risks are not the least ones in this context.

Table 1.C: Breakdown of the Cantons' Agricultural Employment (cp. comments on page 31 above) [1]

The Cantons and their Abbreviations	Main Geographic Regions the Canton belongs to	Agricultural Employees incl. Owners		
		Total in 1000's	Full-time	As Part of Working Population
BS: Basel Stadt	JU	0.1	60 %	0 %
BL: Basel Landschaft	JU	4.3	54 %	4 %
SH: Schaffhausen	JU	2.6	42 %	7 %
NE: Neuchâtel	JU	3.5	56 %	4 %
JU: Jura	JU	3.8	61 %	11 %
SO: Solothurn	JU, PL	5.6	51 %	5 %
AG: Aargau	JU, PL	14.4	51 %	6 %
ZH: Zürich	PL	16.2	55 %	2 %
ZG: Zug	PL	2.1	63 %	4 %
TG: Thurgau	PL	11.7	59 %	11 %
GE: Genève	PL	3.0	76 %	1 %
VD: Vaud	JU, PL, PA	20.4	55 %	7 %
LU: Luzern	PL, PA	17.4	55 %	10 %
FR: Fribourg	PL, PA	12.3	64 %	12 %
SZ: Schwyz	PA	5.5	54 %	10 %
NW: Nidwalden	PA	1.7	55 %	10 %
AR: Appenzell Ausserrh.	PA	2.3	56 %	10 %
AI: Appenzell Innerrh.	PA	1.5	57 %	23 %
SG: St. Gallen	PA	15.6	57 %	7 %
BE: Bern	JU, PL, PA, AL	45.8	57 %	9 %
UR: Uri	PA, AL	2.1	49 %	12 %
OW: Obwalden	PA, AL	2.2	52 %	14 %
GL: Glarus	PA, AL	1.6	62 %	8 %
GR: Graubünden	PA, AL, SA	10.2	50 %	10 %
TI: Ticino	AL, SA	4.4	46 %	3 %
VS: Valais	AL, SA	15.0	29 %	11 %
All		225.1	54 %	6 %

Abbreviations of the regions:
JU = Jura, PL = Plateau, PA = Pre-Alps, AL = Alps, SA = South of the Alps.

Table 1.D: Type and Size of the Cantons‘ Agricultural Land and Livestock
(cp. comments on page 31) [1]

Increasing area of acres / fruit cultures in % of the Canton‘s agricultural surface excl. alpine pastures

	0 – 19%	**20 – 39%**	**40 – 59%**	**> 60%**
0%			**TG** 546 km^2	**BS** 5 km^2
			85 B, 189 P, 15 S	0 B, 1 P, 0 S
			AG 663 km^2	**GE** 117 km^2
			105 B, 81 P, 15 S	3 B, 4 P, 2 S
> 0%		**ZG** 111 km^2	**ZH** 782 km^2	**SH** 138 km^2
		22 B, 18 P, 3 S	112 B, 38 P, 22 S	16 B, 13 P, 2 S
> 5%	**AR** 141 km^2	**LU** 818 km^2	**BL** 222 km^2	
	26 B, 21 P, 8 S	155 B, 335 P, 15 S	30 B, 12 P, 2 S	
			SO 356 km^2	
			48 B, 25 P, 9 S	
> 15%		**FR** 957 km^2	**JU** 413 km^2	**VD** 1393 km^2
		146 B, 78 P, 15 S	59 B, 8 P, 4 S	133 B, 30 P, 14 S
> 25%	**SG** 1011 km^2	**NE** 337 km^2		
	156 B. 163 P, 38 S	42 B, 11 P, 1 S		
		BE 2582 km^2		
		345 B, 245 P, 49 S		
> 35%	**AI** 100 km^2			
	16 B, 27 P, 4 S			
	SZ 384 km^2			
	51 B, 29 P, 19 S			
> 45%	**NW** 105 km^2			
	14 B, 16 P, 3 S			
> 55%	**OW** 190 km^2			
	21 B, 15 P, 4 S			
> 65%	**GL** 217 km^2	**VS** 1135 km^2		
	14 B, 3 P, 3 S	34 B, 3 P, 73 S		
		TI 442 km^2		
		12 B, 6 P, 20 S		
> 75%	**UR** 275 km^2			
	15 B, 3 P, 10 S			
	GR 2215 km^2			
	83 B, 6 P, 64 S			

Increasing area of alpine pastures in % of the Canton‘s total agricultural surface

Remark concerning the dark fields: The larger these fields the higher the percentage of livestock per agricultural area (consideration of 4 average figures: beef alone or beef, pigs, and sheep per total or per total non-alpine surface, respectively).
Abbreviations used: B = Beef, **P** = Pigs, **S** = Sheep or goats (in 1000‘s).

Table 1.E: Breakdown of the Cantons' Industrial Employment (cp. page 31) [14]

Canton: Industrial Employment (1000's & % of residents)	**Main Regions the Canton Belongs to** (cp. insert)	**Industrial Employees in respective Industry** (% of total industrial employment) **0% 10% 20% 30% 40% 50% 60%**
BS: 29.5, 15%	JU	**Instrum. • Paper •• Food • Chemical •**
BL: 28.2, 11%	JU	**Instruments • • Chemical Metals • • Machinery**
SH: 9.5, 13%	JU	**Chemical • • Machinery Metals • • Instruments**
NE: 20.8, 13%	JU	**Food • Machinery • • Metals • Instruments**
JU: 9.6, 14%	JU	**Textiles• Machinery • • Instruments • Metals**
SO: 31.3, 13%	JU, PL	**Paper • Machinery • • Instruments • Metals**
AG: 61.9, 12%	JU, PL	**Paper • • Instruments Machinery •• Metals**
ZH: 97.2, 8%	PL	**Metals • • Machinery Paper • • Instruments**
ZG: 11.1, 12%	PL	**Metals • • Instruments Paper • • Machinery**
TG: 27.5, 12%	PL	**Wood • • Machinery Food • • Metals**
GE: 22.3, 6%	PL	**Metals • • Instruments Chemical •• Machinery**
VD: 36.1, 6%	JU, PL, PA	**Paper • • Instruments Metals • • Machinery**
LU: 30.6, 9%	PL, PA	**Wood • • Machinery Food • • Metals**
FR: 17.8, 8%	PL, PA	**Machinery • • Food Metals •• Instruments**
SZ: 10.8, 9%	PA	**Instrum. • • Metals Wood • • Machinery**
NW: 3.0, 8%	PA	**Paper • Non-metallic Minerals • Machinery Instrum. • • Wood**
AR: 5.5, 10%	PA	**Wood • Metals • • Instruments • Textiles**
AI: 1.0, 7%	PA	**Instrum. • Food • Textiles Metals • • Wood**
SG: 56.3, 13%	PA	**Instrum. • • Machinery Textiles • • Metals**
BE: 79.0, 8%	JU, PL, PA, AL	**Paper • • Machinery Instruments •• Metals**
UR: 3.3, 9%	PA, AL	**Wood • • Metals Leather, Plastic • • Machinery**
OW: 2.6, 8%	PA, AL	**Wood • • Instruments Leather, Plastic • Food**
GL: 5.4, 14%	PA, AL	**Non-met.Min.• • Machinery Metals • • Textiles**
GR: 9.7, 5%	PA, AL, SA	**Instruments • • Wood Food • Chemical**
TI: 29.3, 10%	AL, SA	**Machinery • • Instruments Textiles • • Metals**
VS: 18.4, 7%	AL, SA	**Instrum. • • Chemical Wood • • Metals**

Abbreviations of regions:

JU: Jura
PL: Plateau
PA: Pre-Alps
AL: Alps
SA: South of the Alps

1.4 Major Industrial Sectors and their Emissions

About 20% of the Swiss working population belong to the industries producing goods, while two thirds are in the so-called services sector. In addition, the Swiss industry is to a large extent producing specialties. Therefore, only limited emissions are directly product-related, but there is a significant consumption of energy and a significant corresponding production of so-called greenhouse gases. Nevertheless, the Swiss industry has over the past two decades made remarkable progress in reducing product-related emissions in addition to pursuing energy saving programs [33].

The conclusion of the above is that the few specific emissions shown in the subsequent table 1.F are at no rate illustrating problems which wouldn't have been recognized. They are rather representing a selection which is being addressed – and the mentioning of SF_6 (sulfur hexafluoride, mainly used in the electronics industry, has about 24 000 times the atmospheric warming effect of CO_2 – use in 1995 ~ 100 tons) shall remind the reader of the fact that considering volumes alone is not sufficient.

Table 1.F: Major Industrial Economic Sectors [1, 8, 14]

Industry	**Number of Facilities** **1000's**	**Total Employment** **1000's**	**Output Per Year** **Bio SFr.**	**Major Emissions**	
				Specific	**General**
Food & Tobacco (incl. tobacco)	3.3	65.6	30.0		Heat CO_2 NO_x SO_2 HCl Zn, Hg, Pb .... VOC Dioxins & Furans
Textiles (incl. clothing & furs)	2.2	30.4	5.4		
Wood (incl. wood treatment)	6.9	41.9	11.1		
Paper (incl. paper products)	5.3	77.3	14.7		
Leather, Rubber, Plastics	1.2	27.0	6.1		
Chemical (incl. pharmaceutical)	0.9	65.4	41.7	VOC	
Non-metallic Minerals	1.6	20.5	6.8		
Metals (incl. metal products)	6.0	105.5	21.9	Pb, Hg, Zn	
Machinery & Vehicles	4.7	126.7	72.2		
Electronics, Instruments, Watches	5.6	133.8		SF_6, FHC	
Others Producing Goods	4.5	30.3	≈ 3		
Power Generation & Water Supply	1.3	25.3	≈ 19	Radio-activity	
Total	**44**	**750**	**232**		

The output value per year as shown in table 1.F above represents the total industrial product. The financial 1996 figures presented in the table are based on the so-called 1994 production account and on the production indices of the two following years. The employment figures are based on accordingly extrapolated 1995 counts.- Here, it shall be mentioned that the total output of SFr. 213 Bio generated by the industry producing material goods amounts to more than the 24% mentioned in Table 1.A on page 28 as the latter refers to added value rather than total production.

CHAPTER 2: CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

2.1 Chemical Production, Import and Export

Switzerland has in essence no natural resources of fossile fuels. Still, it has an important chemical industry exporting more than 80% of its consolidated output [16]. Obviously, this has two major consequences: it generates significant imports, and it defines the need to produce high value-added products.

Table 2.A: Chemical Production and Trade [1, 17 - 19]

Type of Chemicals	Importation Bio SFr.	Tons	Exportation Bio SFr.	Tons	Comments
Agricultural:					
- Pesticides	0.34	28 000	1.78	100 000	
- Fertilizers	0.07	241 000	0.01	14 000	
Petroleum Products:					Concerns the total Swiss imports of petroleum products as energy carriers.
- All excl. Gas	2.87	11 880 000	---	---	
- Gas	0.50	~2 000 000	---	---	
Industrial:					Industrial and consumer products cannot be clearly distinguished. Thus, types of products were attributed to either one or the other group.- The subdivision of colorants (dyes and pigments) and pharmaceuticals (active ingredients and final products) is based on approximate 1995 percentages.
- Inorganic Raw Materials	0.50	434 000	0.36	212 000	
- Organic Raw Materials	3.02	957 000	2.61	172 000	
- **Unformed Plastics**	1.57	759 000	1.35	326 000	
- Pharmaceutical Active Ingredients	1.14	43 000 incl. *) below	4.67	92 000 incl. *) below	
- Organic Dyestuffs	0.42	30 000	1.41	60 000	
- Pigments	0.44	22 000	0.47		
- Flavors and Fragr. Materials	0.16	7 000	0.82	24 000	
- Varnishes etc.	0.28	44 000	0.53		
- Processing Aids	0.34	161 000	0.42	143 000	
- Photochemicals	0.30	15 000	0.21	8 000	
Consumer Products:					„Others“ includes detergents with a production volume of ~ 150 000 tons.
- Pharmaceutical	3.42	*)	9.48	*)	
- Cosmetics and Perfumes	0.68	37 000	0.75	26 000	
- Others	0.88	956 000	1.09	245 000	
Total	16.9	17 614 000	26.0	1 466 000	

Comparison of the extrapolated figure of 41.7 Bio SFr. for the total output of the Swiss chemical industry cited in table 1.F, of the 26.0 Bio SFr. shown above as total chemical exports, and of the statement that these exports represent more than 80% of the chemical industry's consolidated output is asking for a comment. Here, two points shall be mentioned.

The first regards the fact that the statistical basis of the two figures is not the same, and the so-called production account [8] used to get the mentioned extrapolation was actually edited the last time in 1994. The second depends on the specific characteristics of the chemical industry producing specialties which in essence are all going back to basic raw materials and passing many intermediate steps before becoming consumer products or being sold to other industries. Thus, there is a significant inter- and intra-company trade of chemical intermediates in Switzerland, and there is a basic difficulty in getting meaningful production figures. The problem is that the definition of „product" is a matter of judgement and that the recording of sales is based on legal entities which may either be highly specialized or be manufacturing all the intermediates in-house.

Therefore, the information regarding production shall be limited to the following statements:

- When looking at the natural raw material situation and the exports, Switzerland is a more important producer of inorganic than organic basic raw materials (no fossil petroleum products).
- Still, Switzerland is refining significant amounts of crude oil (5.25 Mio tons), and it is a producer of all the types of manufactured chemicals mentioned in table 2.A.
- Value-wise the following holds for its chemical production:
  Pharmaceuticals (incl. vitamins and diagnostics) > Raw Materials and Intermediates > Agrochemicals ≈ Dyes and Pigments > Unformed Plastics > Flavor and Fragrance Materials > ..... [19, 20]

2.2. Chemical Use by Categories

The difficulty of assigning types of products to either the industrial or the consumer field is reflected in the difficulty of attributing the corresponding usages, and table 2.B is again containing estimates. In addition, information on product characteristics is more accessible than on marketed amounts as there are complete records of the types of products containing chemicals, which are sold in Switzerland. Even their composition is on file, though available only to the Toxicology Center in Zürich and to the authorities in charge of implementing the Federal Law on Toxic Substances.

Nevertheless, it is possible to get an overview of the about 41 000 potentially hazardous consumer products and the about 102 000 corresponding industrial products in the list to which some 10 000 products a year are added and which contains some 7 000 individual toxic substances [21].

Table 2.B: Chemical Use by Categories [22 - 30]

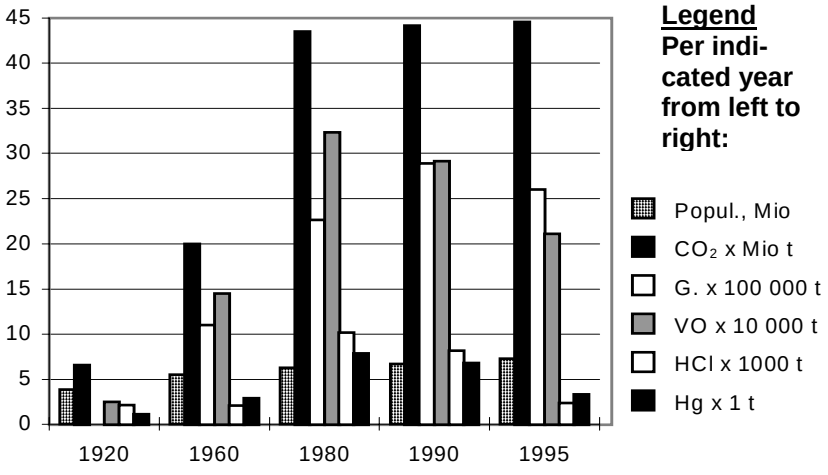
Type of Chemicals	Yearly Use Tons	Mio SFr.	Comments
Pesticides – Agricultural	~ 1800	130	Estimate: same relation agr./gard. as for fertilizers.
Pesticides – Gardening	~ 50		
Fertilizers – Agricultural	~ 400 000		Regards actual tonnage; N-, P_2O_5-, or K_2O-units alone $\rightarrow$ ~ 134 000 tons.
Fertilizers – Gardening	~ 10 000		Regards actual tonnage.
Petroleum Products - Fuels (cars) - Diesel - Kerosene (planes) - Heating (incl. gas)	 3 681 500 1 072 800 1 313 700 7 267 700		No lead $\rightarrow$ 88% of the car fuel excl. Diesel.
Industrial Chemicals (incl. unformed plastics)	> 2 000 000		The bulk are solvents, in spite of significant recycling.
Consumer Chemicals: - Pharmaceuticals - Soaps & Detergents - Others	 ~150 000 > 30 000	 ~3 700 ~150	Pharmaceuticals incl. hospital use. Indicated value of soaps & detergents regards „ex factory“ turnover.
Total	> 15 930 000		

Remarks: The tonnage regarding agricultural pesticides (plant protection) regards 1995. It is almost 500 tons below the corresponding 1990 figure [23].

2.3 Chemical Waste

Chemical waste shall not be addressed without reference to the insert on this page. It puts the problem into perspective and shall be referred to again later-on. Thus, Switzerland has since the 1980‘s made significant progress in controlling waste and emissions, in spite of the continuing population growth, and CO_2 is more and more becoming the main focus [1, 15].

Population Growth, CO_2-Generation, Garbage Production and Selected Emissions:



Non-biogenic CO_2 is still increasing, but mixed household-garbage (G., 1920-figure not available), non-methane VOC’s (VO), and the additional pollutants are decreasing.

Obviously, industry is reducing the amounts of special waste by reducing its being formed at the source. But there remains the challenge of the growing amounts of separately collected special household-garbage like glass, PET-bottles, and batteries [1, 15], and there are still the tonnages of industrial chemicals-containing waste compiled in table 2.C.

Table 2.C: Industrial Chemical Waste Generation and Trade [31]

Type or Source of Waste	Tons/Year Generated	Tons/Year Exported
Acids	25 106	17 374
Akaline & cyanide-containing waste waters & muds	5 210	1 121
Heavy metal-containing residues, muds & waste waters	5 558	1 681
Solids, muds & solutions from metal surface treatment	324	285
Salt & metal oxide/hydroxide-containing residues & solutions	20 715	9 191
Photography chemicals	6 778	14
Catalysts from chemical production	302	275
Batteries	24 612	8 685
Fluorescent tubes & bulbs	883	137
Contaminated adsorbents, materials & objects	42 591	1 769
Contaminated ion exchange resins & eluates	1 782	---
Residues from decanting, filtering & centrifuging	40 063	14 503
Waste containing or forming asbestous fibres	848	---
Powders & air filter residues incl. slags or muds from waste Incineration	83 101	51 835
PCP-containing & similar waste	1 015	782
Contaminated soil	58 746	2 448
Non-metal shredder waste	55 857	---
Mud from street sewage systems	75 387	---
Residues from oil/fuel separators and tank cleaning	134 720	---
Oily/greassy waste from machineries	17 386	---
Fats & soaps of inorganic or biological origin incl. food	7 735	688
Pesticide & plant protectant residues	174	---
Wood protectant residues	17	---
Outdated pharmaceuticals	1 639	---
Processing/distillation residues incl. laboratory chemicals	99 008	3 405
Halogen-containing solvents & solvent mixtures	21 639	294
Non-halogen solvents & solvent mixtures	58 973	1 360
Aqueous solutions containing solvents (incl. hydrocarbons)	31 952	407
Explosive residues	12	---
Residues of paints, varnishes & glues	10 306	1 262
Various	11 970	191
Total	**855 791**	**117 707**

Remarks: Figures refer to 1995 and are available in more detail. Exports go mainly to Germany, France, Belgium, Finland, and the USA. Total imports of wastes for incineration or recycling were about 25 000 tons in 1995 [1]. - Here, it shall be added that dry cleaning contributes about 19% to the total Swiss flux of halogenated solvents [32].

CHAPTER 3: PRIORITY CONCERNS RELATED TO CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

3.1 Priority Concerns Related to Chemicals Import, Production and Use [33]

The generally high standards of industrial risk management and the specific risk awareness of the chemical industry make it in essence impossible to identify true problem areas related to the Swiss chemicals import, production, export, and use. But there is no human zero risk endeavour, and it would be too easy an approach to this National Profile to just say that everything is at its best. Therefore, it shall be attempted to understand how the country's specific situation translates into potential problems and to deduce and prioritize corresponding concerns.

Table 3.A has to be understood in this sense and is reflecting relationships which are at least in part concerning all of the Swiss industry or society rather than just the specific handling of chemicals. Finally, every medal has two sides. This has to be born in mind when looking at the facts in table 3.A which should actually not be read in isolation, but in the context of this whole chapter 3.

Table 3.A: Potential Problems [33 - 35]

Facts	Consequences
Closeness and high density of industrial sites and residential areas outside of the alpine regions.	Very high standards with regard to controlling emissions along with additional restrictions regarding the technical solutions, like scarcity or high price of land and the need to avoid noise, odors, or water vapor clouds. Complex traffic situations. Energy-intensive solutions and corresponding CO_2-generation.
Long history of infrastructure and industrial development.	Restricted flexibility in view of existing solutions representing large investments. Narrow network of railroads transporting large amounts of dangerous goods (especially petroleum products). Construction work taking place in parallel and close to running operations and having a relatively high chance of being slowed down further by encountering historical dumping sites.
Expensive labor, high living standards and wealth.	Advanced automation and dependence on sophisticated software. Accordingly complex safety-engineering and lack of transparency for non-technical people. Corresponding emotional reactions and recruiting problems of technical professions.- Intense exploitation of agricultural land in view of its scarcity and the required profits.
Slow pace of change in view of far-reaching direct democratic rights.	Possible obstacle in view of quickly adapting existing solutions to international developments. Slowing down of developments requiring local change in the interest of regional solutions.

In view of consistency with the IOMC-program the problem areas in table 3.B are organized according to the sequence in UNITAR's guiding document rather than the rank-order of concerns. The last column in the table refers to the subsequent sub-chapter 3.2.- It shall be added for the sake of avoiding misunderstandings that a „low level of concern" is not implying total lack of interest in the given problem area, but indicating that it is reasonably under control. A „high or medium level of concern", on the other hand, is not pointing to a dramatic situation, but rather to a broad consensus in view of a further need to act – and the respective judgements attempt to integrate the opinion of the experts and the public.

Table 3.B: Priority Concerns Related to Chemicals [15, 35, 36]

Problem Area	Level of Concern	Ability to Control	Availability of Statistical Data	Chemicals Creating Concern	Reference to subsequent Subchapter 3.2
Air Pollution	High	Low	Sufficient	**CO_2**	3.2.01
	Medium	Medium	Sufficient	Other green-house gases than CO_2	3.2.01
	Medium	Medium	Insufficient ?	Pollutants resulting in „death of forests"	3.2.01
	Medium	Medium	Insufficient	Pollutants depleting the ozone layer	3.2.01
Pollution of Inland Waterways	Low	High	Sufficient	Fertilizers, pesticides, trace materials	3.2.02
Ground Water Pollution	Medium	Medium	Insufficient	Fertilizers, pesticides, fuel additives	3.2.02
Soil Contam-ination	Medium	High	Insufficient	Acidic green-house gases, historical dumping	3.2.03
Chemical Residues in Food	Low	High	Sufficient	Pesticides, other residues	3.2.04
Drinking Water Contamination	Low	High	Sufficient	Unknown products suspected to reduce fertility	3.2.02 3.2.04
Hazardous Waste Treatment/ Disposal	Medium	Medium	Sufficient	Heavy metals, halogenated solvents	3.2.05
Occupational Health: Agriculture	Low	Medium	Insufficient	---	3.2.06
Occupational Health: Industrial	Low	High	Sufficient	---	3.2.06
Public Health	Low	Medium	Insufficient	Various	3.2.06

Table 3.B (continued)

Problem Area	Level of Concern	Ability to Control	Availability of Stat-istical Data	Chemicals Creating Concern	Reference to subsequent Subchapter 3.2
Chemical Accidents: Industrial	Low	High	Sufficient	---	3.2.07
Chemical Accidents: Transport	Medium	High	Insufficient	Petroleum products, raw materials, intermediates	3.2.07
Unknown Chemical Imports	Low	High	Sufficient	Drugs	3.2.06
Storage/ Disposal of Obsolete Chemicals	Low	High	Sufficient	Components of household garbage disposed of irregularly	3.2.05
Chemical Poisoning/ Suicides	Low	Medium	Sufficient	---	
Persistant Organic Pollutants	Low	Medium to high	Insufficient	Dioxins etc., plastics	3.2.03
Chemicals Poisoning In-door Living Environment	Medium	Medium	Insufficient	CH_2O	3.2.06

3.2 Comments

A general remark shall be made before referring to the last column and addressing the individual entries in table 3.B. above.

The table contains 1 high, 8 medium, and 11 low concerns. Obviously, this is the result of applying a top level scale and underlines the strong will to further pursue the very significant achievements of the past two decades. The same dedication is illustrated by the fourth column of the table, where the availability of data is judged as sufficient in only 11 out of 20 cases. This latter judgement reflects the scientists‘ point of view and should not be read as comparison with some kind of an international average. That has to be considered when now approaching the individual comments.

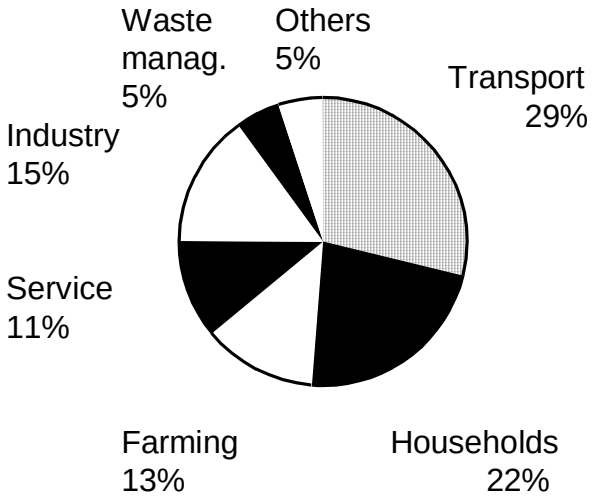
3.2.01: Greenhouse gases are getting the highest level of concern. CO_2 is still increasing (cp. the diagram on page 39), but the additional products resulting from burning fossile fuels (SO_2, NO_x, CO) are decreasing. This is encouraging, but not solving the basic problem, and it will take further strong efforts, innovative tech-

nologies as well as management approaches, and targeted funding to at the same time deal with the consequences mentioned in table 3.A and reduce the CO_2-output. The respective public discussion of a CO_2-incentive tax is animated and still characterized by strongly differing points of view [19, 37]. Nevertheless, Switzerland is proud of its achievements regarding VOC's or heavy metals and confident to make up to the CO_2-targets set by the recent international conferences.

So, the goal has been defined, and pursuing it is as much a matter of international solidarity as addressing imminent Swiss climate problems.

Pollutants potentially harmful to forests are receiving similar attention, though the dimension of the problem is increasingly under debate. But a significant portion of scientific work is still dedicated to the challenge of fully understanding it. After all, forests are transforming CO_2, and the protected percentage of surface they cover (~ 30%) is crucial for the protection of the actual amounts and high quality of ground water.

Main Sources of Greenhouse Gases in Switzerland [15]



Finally, ozone formation and depletion of the ozone layer has also reached a high level of public awareness, and many chemicals (especially FCHC's) have practically disappeared. But there are remaining „unknowns" which have to be addressed, and this is the reason for speaking of a medium rather than low level of concern.

3.2.02: Water was a problem two to three decades ago, but the consequent investment in sewage water purification has, along with very strict rules regarding the use of agrochemicals in forests and with increasing awareness regarding the role of fertilization, led to a very significant improvement regarding surface water. However, this is not eliminating the duty of strictly controlling drinking water (40% from springs, 40% from pumped ground water). E.g., more recent scientific work is raising questions about poorly biodegradable anthropogenic substances with hormone effects like impacts upon fertility of humans and animals. In addition, there are still regions in the less populated parts of the country, where decentralization of the water supply systems makes impossible the sufficiently tight monitoring of potential pollutants in all the drinking water supplied [38]. Still, there is thorough control of all the significant supplies based on surface water, and there is the fact that the pumping sites and springs delivering the remaining part are in general very well protected.

3.2.03: In the past dumping has not received the attention it is getting today [36]. The consequence is that there are now quite a number of historical dumping sites which are registered. Some 3000 are being approached in a joint effort of the respective Cantons and the owners of the land according to established priorities.- Still, acidic greenhouse gases influencing the quality of soil are more of a concern today.

3.2.04: Chemical residues in drinking water and food are generally tightly controlled by the laboratories of the Cantons. Therefore, the known pollutants like pesticides are with a high degree of reliability kept within the tolerated limits. But observations regarding trends towards, e.g., higher incidence of food allergies are raising scientific questions also addressing the role of trace contaminants in water and food.

3.2.05: Industrial hazardous waste is under a high level of control, and incineration is the preferred way of disposal. Nevertheless, there is a certain dependence on international solidarity (cp. the amount of exports shown in table 2.C). In addition, there is a question of proportionality of environmental versus safety aspects especially in the pharmaceutical industry where extreme solvent purity requirements are sometimes excluding the use of recycled solvents.- Regarding household-garbage there is the more recent problem of fees paid per bag, which is responsible for a much more waste-conscious behavior of consumers, but which also has the side-effect of increased illegal garbage disposal. This might create a minor problem of uncontrolled disposal of chemical waste in garbage, while the concern about waste water from households is distinct (includes, e.g., endocrine disruptors).

3.2.06: The Swiss National Accident Insurance Fund (Suva)is providing a broad basis of statistical data and a tight monitoring of occupational health issues [39]. But owners are in principle not covered by this insurance or do not have to be, and a large percentage of agricultural work in Switzerland is actually done by owners. Therefore, there is a certain lack of data regarding that latter field.

Other public health issues are taken care of by the Cantons, and chemicals-related issues are barely having high priority in the public discussion. This does not regard the illegal use of or dealing with drugs, which gets high attention, of course, as a consequence of the structures of modern society. But it cannot in the first place be regarded as a chemicals management problem.- Finally, the potential problem of around-the-hour exposure to emissions from objects in private homes has been addressed, but an in-depth analysis of all the very diverse situations and effects is still not available [21, 40].

3.2.07: Considering the size of the Swiss chemical industry and the amounts of transported chemicals incl. petroleum products, there certainly are very few industrial or transportation accidents; and the corresponding available records can really be called complete. Nevertheless, there is significant concern, and considerable intellectual and practical work is correspondingly invested to prevent accidents or to a priori limit their consequences in case they should happen. This is understandable in the light of the potential problems compiled in table 3.A, and it is understandable as well that there still is a certain lack of data regarding the exact transportation routes.

The latter does not hold, of course, for pipelines and trains, and it only holds to a limited extent for the street transportation in the Cantons along the national border, where the combined information from customs and industry results in a very detailed cantonal picture [41].

CHAPTER 4: LEGAL PRINCIPLES REGARDING THE MANAGEMENT OF CHEMICALS

4.1 Introduction

„Principles“ may be defined as „first or fundamental laws or rules addressing primary issues“. Therefore, the subchapters 4.4 and 4.5 mainly and shortly present „primary issues“ considered in Swiss chemicals-related legislation, while the first three sub-chapters prepare the grounds by mentioning that there are general structural commonalities of Swiss laws, by highlighting their explicit constitutional source, and by linking life sciences and the legal principle of an integrated approach.

The Federal Law on Environmental Protection shall be the example illustrating the **general structure of federal laws**. It contains the following parts:

- **Opening statement** addressing the constitutional basis and the date of the relevant decision
- **1. Title: Principles and general provisions**
  ⇒ includes articles on the law‘s **purpose** and the **principle of cause** (polluter pays) in the first and on **definitions** as well as general **regulations** in the second chapter which, e.g., deals with environmental impact assessments.
- **2. Title: Pollution control (addressing the main provisions)**
  ⇒ Includes chapters on **air pollution, noise, vibrations, and radiation**, on **environmentally hazardous substances**,on **environmentally hazardous organisms** , and on **wastes**.
- **3. Title: Implementation, enactment, incentives and procedures**
  ⇒ Contains three chapters*, includes incentives,* and assigns responsibilities to the Cantons.
- **4. Title: Liability**
  ⇒ Defines the respective liability and the practical means (possibility of mandatory insurance).
- **5. Title: Penalties**
  ⇒ Defines punishable behavior and penalties.
- **6. Title: Final provisions**
  ⇒ Addresses other laws and ordinances, which have to be adapted in the light of the new law, and sets the pace of implementation as well as rules for the transition phase.

Thus, the **constitutional basis**, the **values** (= „primary issues“), the **principles**, the **definitions**, the **protective measures**, the **implementation**, and the **enforcement** are addressed, and this reflects in essence the general structure of Swiss laws.

The **ideas behind new laws** are becoming transparent in the course of the parliamentary sessions and through their press coverage. They are in case of a referendum or a constitutional initiative carefully outlined by the Federal Council (the

government) in the explanatory brochure accompanying the ballots and sent to all the citizens entitled to vote. These brochures are in a valuable way summarizing the ideas and contradictory aspects, which resulted in a final wording. In addition, explanatory documentations are often printed immediately after the introduction of new ordinances or laws and made available to the parties directly concerned, while the explanatory notes distributed along with draft legislation for hearings are providing an early picture of the mentioned ideas.

Finally, there is the abundance and diversity of ideas and ideals guiding the legislative process, which one would expect in a modern, involved, and responsible society. Nevertheless, there is quite general public agreement with regard to the key principles to be compiled later-on in this chapter.

4.2 The Constitution

The amended Swiss Federal Constitution of 1874 is in Art. 2 defining the Confederation's purpose to **sustain** the nation's political (external) independence, to maintain internal peace and order, to protect the freedom and the rights of the Confederates, and to promote their common welfare [42]. This statement as well as quite an extended number of very detailed constitutional articles has been the basis of Switzerland's actual chemicals-related legislation as cited in this National Profile.

Art. 2 of the new Swiss Federal Constitution [43, 44] which has been accepted in a public vote in April 1999 and which is in force since January 1st , 2000, is more explicit in terms of sustainability (a principle, by the way, which may be found already in Cicero's „About the State", 2nd book, about 50 b. Chr.: „A state has to have a constitution which sustains infinite duration"). The new constitutional Art. 2 reads:

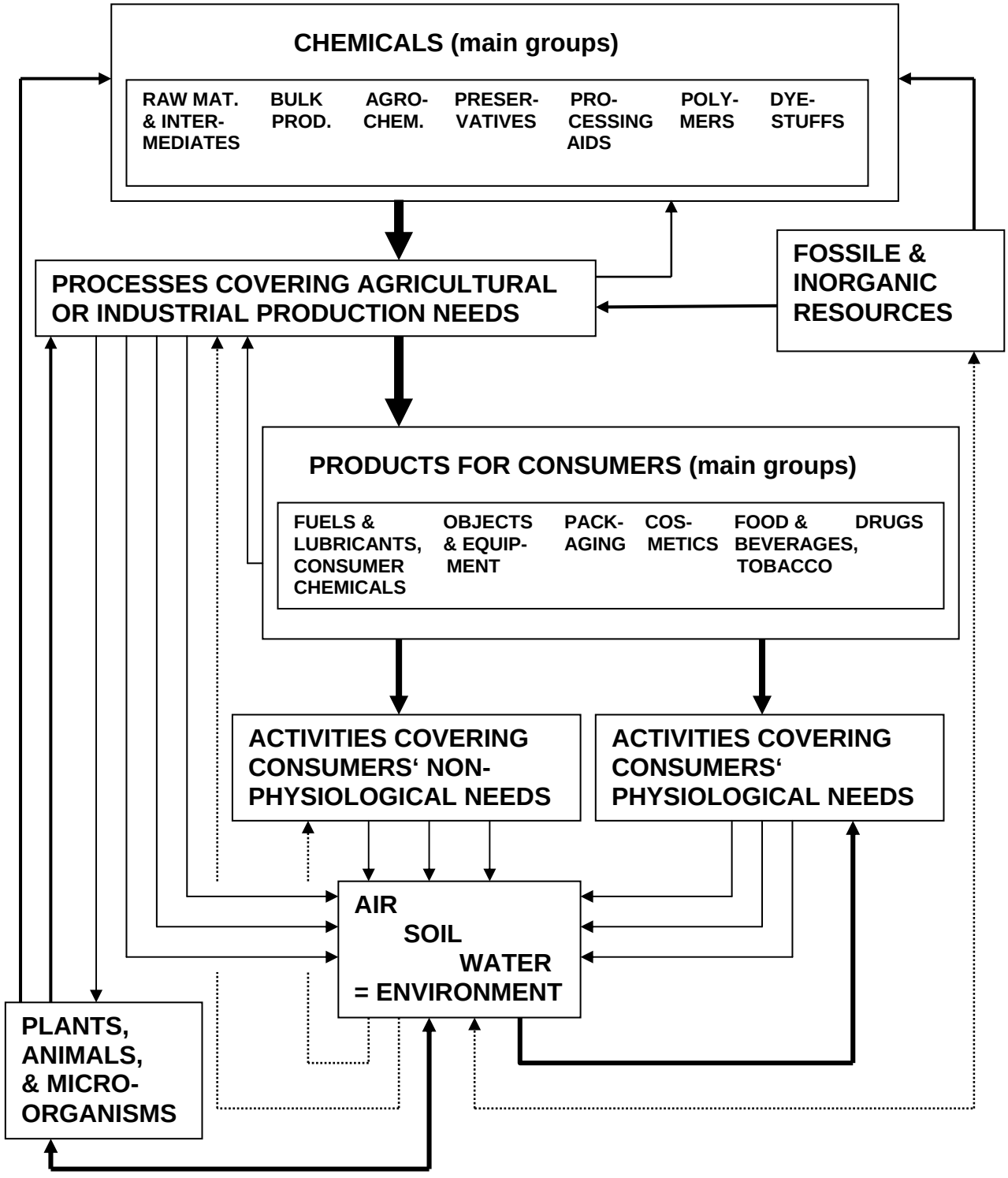
(1) The Swiss Confederation protects the freedom and the rights of the people and maintains independence and safety of the country.
(2) It fosters the common welfare, sustainable development, internal coherence, and cultural diversity of the country.
(3) It provides for the best possible equal opportunities of all its citizens.
(4) It engages in consistently maintaining the natural sources of life and in pursuing peaceful and just international order.

In order to promote inter-disciplinary views (i.a.), the new Swiss Federal Constitution regroups many of the issues already found in its precursor. Still, it is more precise and to the point in many respects. It even contains the term „chemicals" which was still not encountered in the last version of the old constitution available in print.

All this is, of course, extremely incomplete as appraisal of a constitution and disregards very important aspects, like the separation of authorities amongst Confederation and Cantons mentioned in chapter 1. But it has to suffice for the actual purpose.

4.3 Holistic and Integrated Approaches

The following scheme is visualizing **fluxes of chemicals** and underlining the need for integrated approaches, which is emphasized in UNITAR's guiding document for the preparation of National Profiles and which is also respected in Swiss legislation.



The requirement of an integrated view is implicitely met in Art. 8 of the Federal Law on Environmental Protection: Immissions, i.e. impact upon the environment, have to be judged separately as well as combined and in their synergistic interaction. It is directly addressed in Art. 28: Substances have to be handled in such a way as to avoid endangering the environment or indirectly human beings, which concerns the substances themselves, their transformation products, or the resulting wastes. Thereby „handling“ includes, e.g., processing, stocking, manipulating, using, and disposing. Therefore, Art. 28 is, with the exception of direct impact upon human health, covering all the aspects of the above scheme, while Art. 26 obliges those handling chemicals to make-up to the principle of self-control and to diligently protect the environment and indirectly human health. The direct protection of human health is covered by the health-related legislation, of course, i.e. especially by the Federal Law on Toxic Substances and the F.L. on Food and Consumer Products. Animals are, finally, mentioned along with humans in Art. 2 of the F.L. on Toxic Substances, and the latter also cites the respective concomittant applicability of the separate agricultural legislation, of the one on drugs, and of the one on radioactive materials.

One of the consequences of the preceding paragraph is that the present subchapter is at the same time addressing two points: important aspects of the scientific basis of modern chemical risk management, on the one hand, and a principle which is already pursued in Swiss legislation, on the other hand, i.e. the principle of pursuing an integrated approach.

This subchapter shall now be concluded by addressing a practical aspect. Thus, there is the need for clear assignment of responsibilities, a legal principle on its own, which might in the actual management of chemicals get into conflict with the principle of an integrated view. E.g., the double arrow linking the environment and the biosphere (plants, animals, and microorganisms) in the above scheme reminds the reader of the overlap of two legislative domains: environment and agriculture. After all, there is a clear assignment to the Federal Agency for the Environment of responsibility regarding not only soil, but forests and landscape as well. In other words: the biosphere is included in the definition of the environment – and a major part of the biosphere, including relevant parts of soil and even of landscape, is at the same time agriculture’s renewable basic raw material and, i.a., subject of protection for the Federal Office of Agriculture.

Overlaps of the mentioned type have been recognized and addressed, and the problems which might theoretically result are smaller than expected when implementing legislation *in praxi*. This is the consequence, on the one hand, of clear assignments, like of agricultural livestock to the FOA and of wildlife to the SAEFL, and on the other hand, of another legal principle to be mentioned later-on, namely the principle of cooperation.

4.4 Sustainable Development

The principle of sustainable development has become a world-wide key issue since the Rio-conference in 1992 [15]. It has been addressed in chapter 4.2. above, and it adds three main dimensions to the principle of pursuing holistic approaches:

- durability,
- feasibility, and
- economic acceptability.

Therefore, sustainable development is reaching far beyond the strictly chemicals-related legislation. It also touches aspects of, e.g., education or social security, but it has become a major theme in Swiss environment- and chemicals-related legislation.

A prominent approach to sustainable development is based on incentives or incentive taxes, respectively. The VOC incentive tax is an example. It is addressed in Art. 35a of the F.L. on Protection of the Environment and in the Ordinance on VOC-incentive taxes, and it is based on the idea of specifically taxing VOC's and of, i.a., paying refunds (or granting cost savings) to those who prove that they correctly eliminated the VOC's. A somewhat heavy administrative load is the drawback of the procedure, but the direct link of environmental protection and cost saving is expected to have a significant impact.

Generally, the principle of sustainable development aims at implementing economic and ecology-oriented measures supporting the re-establishment of a state of environmental equilibrium and reducing the consumption of fossile fuels. Considering this principle has become a cornerstone of the Federal Council's declared policy [15].

4.5 Other Principles

A number of further important principles are found in the F.L. on Environmental Protection (**LEP**) [45]. They are not completely independent from each other and from the principles cited above. Still, they have in part resulted in specific and effective regulations as illustrated by some of the following examples:

Preventing damage rather than repairing (LEP Art. 1)

⇒ Ord. on Environmental Impact Assessments
Ord.s on Examinations Required to Handle Toxic Substances
Ord. on Preventing Major Accidents

Fighting pollution at the source (LEP Art. 11)

⇒ Ord. on Air Pollution Control
Ord. on Waste Water Discharge

Linking liability and dues for preventive or corrective measures to causative action (polluter pays)

⇒ LEP, Art. 2 and 59

Fostering cooperation

⇒ LEP, Art. 30f, Art 31a, Art. 39, Art. 41a
Signed international agreements (cp. Table 11.B).

CHAPTER 5: LEGAL INSTRUMENTS AND NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS

5.1 Overview of National Legal Instruments Addressing the Management of Chemicals

Tables 1 – 7 of **Annex I** (page 117) are providing an overview of legal instruments relevant to the management of chemicals. They are organized hierarchically in the sense that articles of the Federal Constitution [3] are found in Annex I – Table 1, and they are ordered according to general themes for the remaining parts (the subsequent Tables 2 – 7). Thereby, the articles of the Federal Constitution and some of the cited laws are of a more general nature and aren't explicitely mentioning chemicals. But it certainly is one purpose of this National Profile to generally consider chemicals as goods or parts of goods

- which are owned, purchased, isolated, created, transformed, traded, distributed, used and/or disposed of by human beings,
- which may have beneficial as well as adverse effects upon humans and their environment, and
- which, therefore, are inherently connected with different degrees of risks that are of public, national, or even international interest.

Of course, the last sentence corresponds to a kind of functional definition of „chemical", which basically excludes the bulk of material known with regard to its chemical composition: the water and sodium chloride in the seas of this world, the calcium and magnesium carbonate forming a good part of the Swiss mountains, or even the deoxyribonucleic acid in all the living organisms on this globe. Perhaps, this is as a trivial statement, but it shall underline the importance of looking for the definition of „chemical" when dealing with the respective legislation [46, 47]. Finally, handling chemicals is touched by many legal provisions implicitely among other subjects. The tables in Annex I are considering this, though not absolutely comprehensively.

The focus of Tables 2 - 7 of **Annex I** is on the following topics:
Table 2: food, consumer and industrial goods, and toxic substances;
Table 3: drugs and health;
Table 4: agriculture and the environment;
Table 5: wastes, prevention of accidents, transportation, and warning mechanisms;
Table 6: weights and measures, accreditation, and professional education; and
Table 7: supplies and trade.

This creates overlaps here or there, but double mentions of ordinances or laws have been avoided. Here, it shall be added that especially the import- and export-related aspects of the legislation are conveniently compiled in the so-called Restrict List periodically edited by SSCI, the Swiss Society of Chemical Industries, and available to its members [48].

5.2 Key Legal Instruments Relating to Chemicals

The following federal laws and derived ordinances are certainly key (dates of first edition and references to tables in Annex I in brackets). Prints of all of them may be ordered in writing from EDMZ (Eidg. Drucksachen- und Materialzentrale, CH-3000 Bern – Federal Publications and Supplies Office).

- F.L. on Toxic Substances (21.03.69 – Table 2, SR 813.0), **LTS**,
  - Ord. on Toxic Substances (19.09.83 – Table 2, SR 813.01), **OTS**,
  - Ord. on MSDS's (09.11.98 – Table 2, SR 813.013.4), **OMS**,
- F.L. on Environmental Protection (07.10.83 – Table 4, SR 814.01), **LEP**,
  - Ord. on Air Pollution Control (16.12.85 – Table 4, SR 814.318.142.1), **OAP**,
  - Ord. on Environmentally Hazardous Substances (09.06.86 – Table 4, SR 814.013), **OHS**,
  - Ord. on Movements of Special Waste (12.11.86 – Table 5, SR 814.610, earlier SR 814.014), **OMW**,
  - Ord. on Protection Against Major Accidents (27.02.91 – Table 5, SR 814.012 – also based on LPW), **OMA**,
- F.L. on Protection of Waters (24.01.91 – Table 4, SR 814.20), **LPW**,
  - Ord. on Protection of Waters Against Hazardous Liquids (01.07.98 – Table 4, SR 814.202), **OPL**,
  - Ord. on Protection of Waters (28.10.98 – Table 4, SR 814.201) **OPW**,
- F.L. on Agriculture (03.10.51 – Table 4, SR 910.1), **LA**,
  - Ord. on Plant Protection (05.03.62 – Table 4, SR 916.20), **OPP**,
- F.L. on National Supplies (08.10.82 – Table 7, SR 531), **LNS**,
- F.L. on Control of Dual-Use Goods (13.12.96 – Table 7, SR 946.202), **LCG**,
  - Ord. on Control of Chemicals (03.09.97 – Table 7, SR 946.202.21), **OCC**,
- F.L. on Narcotics and Psychotropic Substances (29.05.96 – Table 3, SR 812.121), **LNP**,
  - Ord. on Precursors of Narcotics and Psychotropic Substances (29.05.96 – Table 7, SR 812.121.3), **ONP**.

The first and the last of the above-mentioned federal laws and derived ordinances are implemented under the control of the Department DHA, F. O. for Public Health, the second and third under the control of the Department DETEC (through SAEFL), and the fourth to sixth under the control of the Department DEA (in the case of LNS jointly with the Department DDPS) . The Cantons are charged with significant implementation responsibility in all cases and are in essence in charge of the public risk management of the industrial, commercial, and agricultural operations within their territory – of course with the assistance of the respective federal offices or agencies and research institutes and with some guidance these bodies provide.

Finally, the federal laws on work in industry and trade and on insurance against accidents play a role in view of chemical risks related to **occupational safety and**

health. In charge are the State Secretariat for Economic Affairs and the Federal Social Insurance Office, respectively.

The Superior Customs Direction is playing a pivotal role by providing control and supplying information regarding goods shipped across the national border [4, 49]. Thus, there is control of fluxes of chemicals thanks to the different types of permits granted and inspections held by the Cantons (re. operation of production, storage, and trading facilities, pollution control, medicinal responsibility, etc.), the registrations or notifications handled by federal agencies, and the documents turned in to the Superior Customs Direction (belonging to the Department DF). The latter sends the complete lists of imported chemicals (excl. fuels) to the F.O. for Public Health which forwards the information to the respective addressees' Cantons. They use it for control purposes and have to keep it confidential (cp. chapter 6.3 as well as reference [60] regarding further details on the Cantons' practical and legal means) .

Finally, the Federal Office for Public Health keeps files, in accordance with Art. 25 of LTS, of all the commercial toxic products belonging to the poison classes 1 – 5 (some 150 000 products – entered into the file without regarding the amounts produced or used). This file of toxic commercial products is subdivided into 3 lists, i.e.

- individual substances (list 1 – about 7000 entries),
- industrial products (list 2 – about 102 000 entries), and
- consumer products (list 3 – about 41 000 entries; excludes, e.g., drugs, food, or cosmetics).

The file contains the complete composition of all these products and is kept confidential with few and strictly defined exceptions [21], whereas the classification of the products according to the list of poisons (classes 1 – 5) is public. In addition, the file contains the composition of some 50 000 products which did not have to be classified as „poisons" in the final analysis.

Of course, the list of substances is to a large extent also covered by the European Inventory (EINECS), but the confidential list of commercial products has a specific focus on toxic substances and on precise composition of the marketed items.

5.3 Legislation Addressing Various Stages of Chemicals from Production/Import through Disposal

Table 5.A is organized according to use categories. It is referring to the abbreviations compiled in the preceding subchapter 5.2 and to the tables in **Annex I**.

Here, it has to be added that table 5.A below attempts to compile the most relevant aspects, but that it cannot be regarded as comprehensive. In addition, there are requirements and rules which have to be regarded throughout the products' life cycle, like the requirements regarding occupational safety and health (cp. Table 3 in Annex I, i.e. especially the F.L. on Insurance Against Accidents and the F.L. on Work in Industry and Trade).

The abbreviations of laws and ordinances used in the table are explained above (page 54) as well as in the list of abbreviations on page 143, while SR-numbers are used, where no abbreviation has been defined for the purpose of this National Profile.

Table 5.A: Legal Instruments to Manage Chemicals by Use Category

Category of Chemical	Imports	Production	Storage and Transports	Distribution and Use	Disposal
Pesticides	LA OPP SR 916.161 (Table 4) OHS LTS OTS	OHS OMA OPL LTS OTS OAP	OMA OPL OAP	LA OPP SR 916.161 (Table 4) OPL LTS OTS OAP	OHS OMW LA
Fertilizers	OHS LTS OTS	OHS OMA OPL LTS OTS OAP	OMA OPL OAP	LA OHS OTS OAP	OMW LA
Industrial Chemicals	OHS LCG OCC LNP ONP OMS	OHS OMA OPL OAP LTS OTS	OMA OPL OAP	LTS OTS OMS OAP	OHS OMW OPW SR814.015 (Table 5)
Petroleum Products (fuels)	LNS (OHS incl. combustion promotors)	OMA OPL OAP	OMA OPL OAP	OAP	SR 814.015 (Table 5)
Consumer Chemicals	OHS LTS OTS	OMA OPL LTS OTS	OMA OPL	LTS OTS OHS	OHS SR 814.015 (Table 5)
Chemical Wastes	OMW	OMW OPL SR 814.015 + 814.225.21 (Table 5)	OMW OMA OPL	OHS (addresses i.a. contaminants of incineration residues)	OMW SR 814.015 + 814.225.21 (Table 5)

Additional remarks on OHS and OTS and on occupational safety and health:

OHS, the Ordinance on Environmentally Hazardous Substances, is in essence not regulating use and distribution – besides defining general diligence principles, of course. But **OHS** is including the use in its definition of given, selected classes of products and in its eventual restrictions. However, **OTS**, the Ordinance on Toxic Substances, is primarily classifying the substances in toxic categories which are

criteria for restrictions in their distribution and use. Thereby the bulk of petroleum products, i.e. car fuels and heating oil, are handled according to special rules. Finally, the legislation regarding **occupational safety and health** is in the first place addressing measures, e.g. safety measures, the employer has to take, but also addressing product categories to some extent.

5.4 Key Approaches and Procedures for Control of Chemicals

Key legal instruments and the role they play in view of the chemicals‘ life cycle have been mentioned in the subchapters 5.2 and 5.3. The focus of the present subchapter is on the approaches pursued in their control.

There are two basic approaches to structuring the control of chemicals-related risks:
The **leading dimension** may either be

- the „risks“ or sources of risk themselves, i.e. the chemicals, or
- the values or targets of protection, i.e. in essence health and the environment.

Switzerland has taken the second approach [21]. Thus, the legal responsibilities for protecting human health, workers‘ health, food, drinking water, objects of daily use, the environment in terms of air, waters, soil, vegetation, and animals, agriculture, forestry, industry with its different types of products, or trade have to be defined individually in terms of given sources of risk like, e.g., pesticides.

This approach results in very few absolutely forbidden products and in numerous mentions and restrictions regarding given substances or classes of products. Still, there are regulations with a strong focus on the chemicals, i.e. the Ordinances on Toxic Substances (OTS), on Forbidden Toxic Substances (OFTS), and on Environmentally Hazardous Substances (OHS).

Finally, there are uses and types of new or old (already known or listed) chemicals, of course, requiring either **registration** or **notification** or at least **availability of data** according to the following federal laws or regulations [5, 21].

- F.L. on Toxic Substances
- F.L. on Environmental Protection
- F.L. on Food and Commodities
- F.L. on Agriculture
- F.L. on Epidemic Diseases
- Intercantonal Agreement on Drug Control.

One further word shall, however, be added before turning to registration and notification and to the graphic illustrating the respective details. It regards „due diligence“, i.e. the producer’s, importer’s, user’s, or distributor’s liability and duty to prevent damage, to control the efficacy of his measures, and to comply with the law as addressed, e.g., in Art. 26 of the Federal Law on Environmental Protection and Art. 9 of the Ordinance on Environmentally Hazardous Substances. It is important

and is actually the legal basis of the sound management of chemicals in Switzerland, while the follow-up measures and governmental controls are in essence just here to confirm its functioning. Therefore, there is a fundamental attitude of responsiveness and compliance, and this is probably the secret of the smooth functioning of the whole system. Still, it is up to FOPH to finally judge the toxicity of new components to be marketed, and it is up to SAEFL to, e.g., finally judge available data on environmental impact. The producer may not independently take the respective decisions. Thus, one finds in the Swiss legislation very clear statements on due diligence, e.g.:

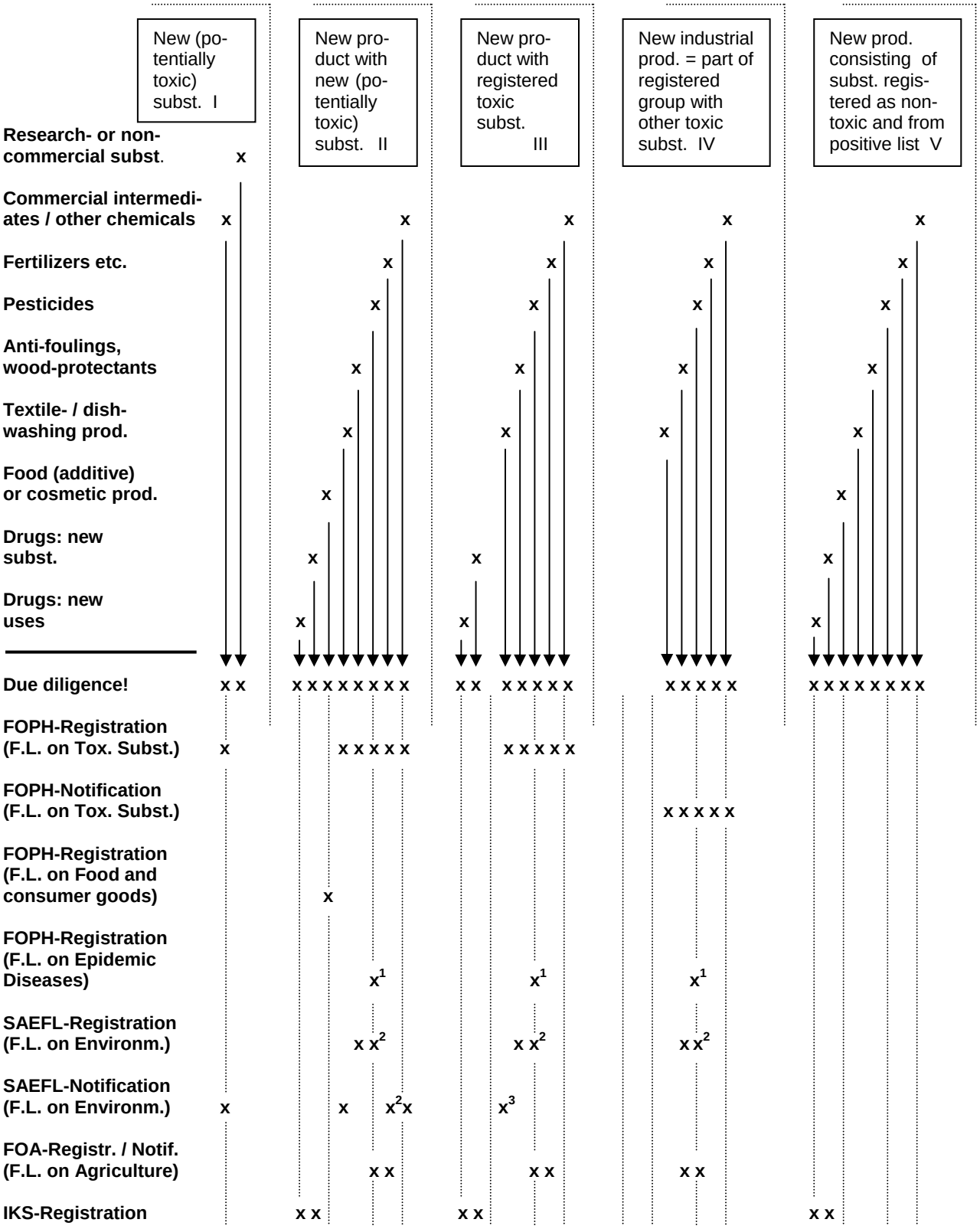
- Art. 18 of the Ord. on Environmentally Hazardous Substances:
  The producer has to re-evaluate or amend the judgement of substances, products, or objects of use, if
  .....
  (e) a judgement which differs from the one based on past experience and practical application is stipulated on the grounds of new information or insight.

- Art. 19 of the Ord. on Environmentally Hazardous Substances:
  The producer of substances has to notify SAEFL about the results of his self-control, in case
  .....
  (c) a substance which has been the subject of an earlier notification has to be re-evaluated (cp. Art. 18).

- Art. 7 of the Ord. on Toxic Substances:
  .....
  (3) In case of doubt, the producer, importer, or agent has to seek information with FOPH on a given substance's or product's being subject to the F.L. on Toxic Substances.

The graphic representation on the next page is illustrating the respective requirements, while table 5.B on page 62 compiles the substances which are strongly restricted or banned. Explanations regarding the graphic are found on page 60.

REGISTRATION AND NOTIFICATION



[1] Special use, e.g. in stables [2] Exclusive use in house and garden [3] Specific new use

Explanations regarding the graphic representation on the preceding page:

The graphic representation visualizes the registration and notification requirements. It is not absolutely comprehensive, but it illustrates the main aspects.

The upper part of the representation is a matrix connecting types or ensembles of components (I – V), i.e. substances or products, with uses as , e.g., pesticides or food additives.

The lower part of the representation is a second matrix connecting all the elements in the first matrix with the respective regulatory requirements. Thereby it is important to notice that a given element in the upper matrix may be connected with one to several entries in the one below.

There is in the lower matrix at least one entry per element of the upper for the sole reason that „due diligence“ is included as a regulatory requirement, in spite of the fact that due diligence is not a „regulatory requirement“ in the strict sense of the word and not necessarily resulting in an obligation to contact authorities. Still, it deserves mention, because it is a basic requirement in every activity involving commercial goods in general and chemicals in particular.

The arrows in the upper matrix and their selected continuations as dashed lines in the lower matrix shall assist the reader in unambiguously assigning the connected entries in the two matrices.

Finally, a word about terminology and about the point that there is no „x“ in some of the fields of the upper matrix:

The latter is due to the fact that some combinations are inconceivable. E.g., one couldn’t market food containing strongly toxic substances as „components“.

The mentioned example is taking the reader to the former point, i.e. the terminology and its ambiguity. Here, one has to realize, that „components“ addresses substances or mixtures purpously added and that it excludes, e.g, trace impurities of pesticides in the flour the baker is using to bake bread. Thus, a small bakery may count on the flour supplier’s due diligence, but it may still not neglect its own due diligence and may not, e.g., get its supplies from a doubtful source. Further ambiguities are addressed in the Glossary (page 136) and regard, e.g., the terms „toxic“, „commercial“, or „product“.

Abbreviations:

Subst. = Substance(s)
FOPH = Federal Office for Public Health
FOA = Federal Office of Agriculture
F.L. = Federal Law
Prod. = Product(s)
SAEFL = Swiss Agency for the Environment, Forests and Landscape
IKS = Interkantonale Kontrollstelle (Intercantonal Office for the Control of Medicines)

Registration or notification and ,e.g., corresponding mentions in the lists of poisons may also take place after a first introduction into the market, if new information is becoming available. The initiative may in these cases come from all the parties involved:

- the Federal Office for Public Health, FOPH,
- the Swiss Agency for the Environment, Forests and Landscape, SAEFL,
- the Federal Office of Agriculture or the Agricultural Research Institutes,
- the cantonal authorities,
- the producers, importers, or distributors themselves, or
- professional or other private organizations concerned.

Registration and notification are not only defining the right to distribute given items, but they also include **labelling** provisions.

There are additional key approaches to control fluxes and management of chemicals. In terms of separation of authority as well as responsibilities there are federal and cantonal laws and ordinances as well as mechanisms concerned with the **safety of operations and their environmental compatibility**. Regarding the latter the cantonal implementation of environmental laws and ordinances is playing a crucial role along with the federal legislation regarding **occupational safety and health**. Thus:

- **Emissions** of a given operation are controlled in accordance with the Federal Law on Environmental Protection and the Federal Law on Protection of Waters and in accordance with the main derived ordinances.
- **Safety risks in the immediate neighbourhood** of the operation and the **transportation risks** it is posing are controlled in accordance with the Ordinance on Protection Against Major Accidents (derived from the F.L. on Environmental Protection) and, of course, with the relevant traffic regulations etc.
- **Internal safety risks** of the given operation are controlled in accordance with the federal and cantonal laws on industry and labour and the Federal Law on Insurance and especially with Suva-regulations (Suva = Schweizerische Unfallversicherungsanstalt, Swiss National Accident Insurance Fund) concerning occupational health and addressing, e.g., hygiene standards, explosion prevention, or maximum workplace concentrations of chemicals. The last point is the subject of an extensive corresponding list containing acceptability levels (German: MAK-Liste) [39].

The third key approach to be addressed regards **importation and exportation of chemicals**. There are basically two aspects which have to be considered: the aspect of facilitation of international trade as a vital prerequisite for the country's survival and the aspect of control and restrictions warranting environmental and health-related protection as well as conformity with international obligations. The first represents the focus of the federal laws and ordinances on

- Financial Support for the Swiss Central Office Fostering Trade (F.L. – SR 946.15),
- Measures regarding International Economy and Trade (F.L. - SR 946.202),
- Exchange of Dual-Use Goods with Foreign Countries (Ord. – SR 946.202.1),
- National Supplies (F.L. – SR 531), and
- Technical Trade Barriers (F.L. – SR 946.51).

The second aspect is covered by many of the laws and ordinances mentioned in Table 7 in Annex I. Its implementation is supported by the already mentioned Restrict List available to members of the Swiss Society of Chemical Industries (SSCI), which contains more than 3000 individual chemicals or products and which is available as a computer file on discette.

All the international aspects mentioned in the preceding paragraph are, of course, mainly implemented by national authorities, i.e. by the Superior Customs Direction and by the Ministry for Economy (DEA).

Finally, table 5.B compiles chemicals and classes of chemicals which are severely restricted or banned.

Table 5.B: Severely Restricted and Banned Chemicals

Chemicals & Groups of Chemicals	**Forbidden Uses, Exceptions (exc.), and Comments according to OFTS and OHS**
As & derivatives	Pesticides, colors in & around buildings or on objects of use, textiles for clothing – Ordinance on Forbidden Toxic Subst. (OFTS)
Pb & derivatives	Colors in buildings, textiles for clothing (OFTS)
Alkyl-Pb	All uses, exc. engine fuels (OFTS; OAP-limits!)
Hg & derivatives	Water purification, colors in & around buildings or on objects of use, textiles for clothing, consumer pesticides (OFTS)
Tl & derivatives	Fighting rodents (OFTS)
Strychnin	Fighting rodents (OFTS)
Benzene & CCl_4	Consumer & industrial products, exc. C_6H_6 in engine fuels & toluene or xylene ($\leq$ 0.5%) (OFTS)
CH_3Br	Fire extinguishing, cooling (OFTS)
Ortho-Trikresylphosphate	Colors, varnishes, household-products (OFTS)
Aldrin, Chlordan, Dieldrin, Endrin, Heptachlor (incl. epoxide), Methoxychlor, Stroban, Telodrin, Toxaphen, DDD, DDE, DDT, Kelthane, Perthane, Hexachloro-benzene, Hexachlorocyclohexane	Consumer & industrial products; some exc. for agricultural use according to the respective Research Institute (Liebefeld) for Toxaphen, Kelthane, Hexachlorobenzene, Methoxychlor (OFTS)
Chlorinated biphenyls (PCB)	Consumer & industrial products (OFTS)
Para-Phenylendiamine, Picric acid, and other toxic subst. which are easily penetrating skin	Clothing (OFTS)
Toxic acids & bases (classes 1 – 4)	Use in pressure containers (sprays) (OFTS)
O_3	In-door ozonization > 0.1 ppm in air (OFTS)
Subst. of **poison class 1**	Generally forbidden in consumer products (OFTS)

OFTS: Ordinance on Forbidden Toxic Substances (SR 814.839).
OHS: Ordinance on Environmentally Hazardous Substances (SR 814.013)

Table 5.B (continued)

Chemicals & Groups of Chemicals	**Forbidden Uses, Exceptions (exc.), and Comments according to OFTS and OHS**
Halogenated organic subst. as above (Aldrin ...) + penta- & tetrachloro-phenols + some halogenated naphthalenes & Ter-phenyls + trichlorophenoxy fatty acids & derivatives	Production, selling, import, and use; exc. regarding research, some in agriculture (OHS)
Hg & derivatives as above	Selling, importing (trade), use with some exc. like in medicinal applications & research (OHS)
Asbestos	Use with exc. if no alternatives are possible (OHS)
Ozone layer depleting subst.: thoroughly or partly fluoro-chlorinated or fluoro-brominated compounds up to C_3 + CCl_3CH_3 + CCl_4 + Bromomethane	Use with some exc. (OHS)
Octyl-/Nonyl-phenolethoxylate, chlorinated organic subst., EDTA or PDTA & salts >0.5%, NTA, P > 0.5%	Textile washing products; partly forbidden in other cleaning products (OHS)
Batteries with pollutants	Disposable watches & cameras or packagin materials & telegram messages containing them (OHS)
Plastics containing Cd or ozone layer depleting agents	Production, import ; some exc. (OHS)
Cd in anti-corrosion applications	Trade, selling; some exc. e.g. antiques (OHS)
Trialkyl- or triaryl-Sn derivatives	Antifoulings; some exc. (OHS)
Chlorine-containing solvents	Production, selling, import, use; some exc. (OHS)
Coolants containing ozone layer depleting agents	Devices containing the coolants (OHS)
Fire extinguishing agents containing ozone layer depleting subst.	Selling, importing of the fire extinguishing agents (OHS)
Pb-containing bottle covers	Import, trade, selling of the bottles; exc. old wines (OHS)
Fertilizers from composte or sewage slug containing Pb, Cd, Cr, Co, Cu, Mo, Ni, Hg, Zn, adsorbed organic halogen compounds above defined limits	Use; exc. upon special permission (OHS)
Thawing agents containing other active ingredients than NaCl, KCl, $MgCl_2$, urea, biodegradable lower alcohols	Use, selling (urea only on airports and potentially corrosive sections of roads) (OHS)
PCB and similar products in condensers, transformers etc.	Use or selling of corresponding devices (OHS)
Some 40 items in waste water	List in Ordinance on Waste Water Discharge (limits!)
Air pollutants (list)	Exhaust limits according to Ord. on Air Pollution Control
Some 3000 items re. importation	SGCI Restrict-List adressing several ordinances

5.5 Non-regulatory Mechanisms for Managing Chemicals

The following bodies contribute non-regulatory mechanisms regarding the management of chemicals:

- the chemical companies themselves
- industrial and commercial associations
- companies basing their business on assistance regarding the management of chemicals
- recycling and waste treatment companies
- professional associations like, e.g., of cantonal chemists
- universities and technical colleges
- non-profit or governmental organizations
- other organizations interested in protection of the environment or of consumers and health.

They provide risk reduction, educational and research programs to be mentioned later-on in this National Profile. But there are also important practical measures of chemical companies going beyond regulatory requirements. Their goal is to make up to future requirements or international standards, to comply with international clients' demands, to reduce interruptions due to accidents, or to improve profitability by eliminating risks and costs through changes of processes [50]. Thus, there is a vital focus on optimum management of chemicals in chemical industry and trade. The same holds for waste treatment and recycling companies requiring defined standards in the goods they are accepting.

Regarding formal approaches SSCI, the Swiss Society of Chemical Industries representing some 95% of the concerned larger companies, has its codex of conduct in exportation, which implements the UNEP-guidelines (London 1989) and the FAO International Code of Conduct (1989). In addition, more than 85% of the SSCI member-companies as well as many smaller ones have in the meantime signed to the principles of the Swiss Responsible Care Program which corresponds to the international ICCA- and the European CEFIC-program [19].

Certified private companies are furthermore enabling chemical and trading companies to get ISO-certificates, and many are pursuing the environment-oriented ISO 14001 certification besides the ISO 9000 norms which are quality-oriented, but which are implicitely improving the safe management of chemicals as well.

Finally, there are government-driven programs like „Energy 2000", heading for the reduction of CO_2-emissions, or „Agricultural Policy 2002" which envisages ecological equilibrium regarding fertilization; and there is Switzerland's pioneering role regarding environmental incentive taxes. Such taxes are currently being implemented with regard to volatile organic compunds (VOC's) and sulfur containing light oil for heating (> 0.1% S getting taxed), while a CO_2-tax is discussed, but not introduced yet in view of voluntary reduction programs pursued by industry [19].

5.6 Comments and Analysis

This subchapter is meant to give a kind of a summary analysis and to comment on the combined legal and non-regulatory approaches to the management of chemicals, which have been addressed up to here. Therefore, the reader shall again be reminded of the following facts:

- The Swiss federal legislation is often defining the basic principles, while the Cantons are in charge of the implementation.
- The separation of authorities amongst the Confederation and the Cantons depends on the topic and is not the same for, e.g., environmental and health matters.
- Switzerland does not have a counterpart to the American FDA: Food and drugs are regulated according to differing approaches
- The chemicals-related legislation is basically oriented towards subjects or dimensions to be protected, rather than classes of chemicals or products posing specific risks. This is not the approach of the European Union (EU).
- In essence the same classes of chemicals are addressed in the Ordinance on Environmentally Hazardous Substances and in the Ordinance on Forbidden Toxic Substances, but their definitions are not always identical.
- Switzerland is not a member of the EU, but it is surrounded by EU-countries, and its strongly export-driven chemical industry exports large amounts of products to the EU. Therefore, the Swiss industry is voluntarily respecting many EU and other international rules in addition to Swiss legislation.
- The Swiss legislation regarding toxic substances dates back to the late 60‘s. It is complete with regard to the control of the respective types of products on the market, but disregarding marketed amounts or fluxes of products.
- The system of poison classes 1 – 5, which excludes food, drugs, and cosmetics and which exists since the late 60‘s, is applied to all respective types of commercial products – regardless of their being, e.g., pesticides or colorants. This might have drawbacks in view of differing information and labelling requirements connected with different types of products and risks.
- Chemicals are differently managed as drugs, as food additives, as agricultural tools or residues in agricultural products, as intermediates, as risks to which workers are exposed, as environmentally relevant products polluting air, waters, and soil, or as items to be transported, e.g., by the federal railways.

The above compilation of facts might give the impression of a complex and poorly manageable situation. But Switzerland has learned to live with them, and its rules of always submitting new legislation to the scrutinity of extensive hearings has resulted in a fully enforceable and balanced legal structure. Its complexity is also managed when new technologies appear and new laws have to be generated (e.g. regarding genetically engineered products). However, this type of events is implying the need to reconsider older ordinances and definitions, and this is resulting in an overall rather heavy process. But legislation is here to shape realities as well as to adapt to changes, and this is the reason for the current discussion of a new draft of a Swiss law concerning the management of chemicals.

The mentioned Chemicals Law under discussion would substitute the actual Law on Toxic Substances [46]. It would i.a. allow for enlargement of the meaning of the terms „substance“ or „preparation“, introduce the possibility of considering amounts of marketed products, define risks in a more flexible way, and result in a more coherent relationship with the Law on Environmental Protection. But the draft has not yet taken all the hurdles.

Finally, a word about two non-regulatory aspects: The first regards the strong international exposure of managers in the Swiss chemical industry, which imparts an in-depth knowledge of foreign regulatory approaches. The resulting distinct effort to contribute to international harmonization is a logical consequence. It is pursued through participation in international organizations and through fostering this point in national associations.

The second aspect regards environmental awareness. Here, Switzerland has been playing a pioneering role, and its industry and trade have been making enormous efforts. But there are remaining challenges, and the thinking is more and more directed towards integral analyses and rational consideration of the proportionality of individual measures. The joint effort made by SAEFL and the chemical industry to establish a Swiss Pollutant Release and Transfer Register (PRTR) is supporting such an approach [51].

CHAPTER 6: MINISTRIES, AGENCIES AND OTHER INSTITUTIONS MANAGING CHEMICALS

6.1 Responsibilities of Different Government Ministries, Agencies and Other Institutions [4, 52]

Switzerland has seven ministries, the so-called Departments which are all headed by a member of the national government. These seven Federal Councilors are forming the Federal Council, the country's highest level of executive power, and are implementing the principles of the Federal Constitution as well as the federal laws which have been approved by the bicameral parliament and which have taken the hurdle of the facultative (non-mandatory) democratic referendum. Based on these laws are the Ordinances and Derived Ordinances which are issued by the Federal Council or the Departments, respectively.

The principles of the Federal Constitution may be amended or changed upon popular, cantonal, or parliamentary initiative, and these changes and amendments are subject to obligatory federal votes. Finally, the federal political system is completed by a number of additional authorities and administrative bodies. Especially important are the Federal Chancellery supporting the Federal Council and the Federal Supreme Court controlling legal coherence and having the final responsibility regarding jurisdiction and legal complaints.

The Cantons have analogous political structures, though they don't have bicameral parliaments. They are playing a key role in terms of implementing federal laws and ordinances.

The whole political structure described is resulting in many interactions and is functioning mainly thanks to a political culture of respecting powers reserved and of taking initiative, if appropriate and required. Extensive hearings in the context of introducing new legislation are one important aspect of this political culture. They are always involving the 26 Cantons and the relevant professional, industrial, and other public organizations. Therefore, it doesn't come as a surprise that all the ministries are involved at least in specific aspects of the management of chemicals and that there is strong involvement of the Cantons as well. This is illustrated by table 6.A.

Table 6.A is to quite an extent self-explanatory in terms of ministerial mandates. Nevertheless, the point shall be shortly amended in subchapter 6.2. and before addressing the role of the Cantons. But the latter is key in view of the focus of this chapter 6 which, in contrast to chapter 5, is more on organizational than on legal aspects.

Table 6.A: Responsibilities of Ministries, Agencies and Other Authorities [4, 49]

Departments and Relevant Assigned Federal Offices (F.O.) or Agencies (A.) etc.	Imports & Exports	Production	Storage	Transport	Distribution, Marketing	Use, Handling	Research	Disposal
DFA								
Directorate for International Law	X			X				X
DHA								
F.O. for Public Health	X	X	X		X	X		
Science & Research Group							X	
DJP								
F.O. of Police	X				X			
F.O. of Metrology						X		
Federal Institute of Intellectual Property					X		X	
DDPS								
Central Office for General Defence	X		X					
National Emergency Operations Center						X		
DF								
Federal Customs Administration	X			X				
Federal Alcohol Administration	X				X			
DEA								
State Secretariat for Economic Affairs	X	X		X	X	X		X
F.O. of Agriculture					X	X	X	
F.O. for Professional Training & Technology						X	X	X
DETEC								
F.O. for Transport				X				
F.O. for Civil Aviation				X				
F.O. for Water Management		X	X	X		X		X
A. for the Environment, Forests and Landscape	X	X	X	X	X	X		X
EKAS (Coord. Committee for Occupational Safety)		X	X	X		X	X	
Intercantonal Office for the Control of Medicines (IKS)		X			X	X	X	
Cantons		X	X	X	X	X	X	X

6.2 Comment on the Departments‘ Chemicals-related Mandates, Authorities and Means

DFA, Department of Foreign Affairs:
This department is only indirectly involved in chemicals, but the **Directorate for International Law** acts as the legal advisor on all matters which require international regulation.

DHA, Department of Home Affairs:
The **Federal Office for Public Health** plays a crucial role with regard to chemicals, which includes registration of toxic substances in industrial and in consumer products and their labelling as well as the liaison with the respective cantonal authorities.- The **Federal Social Insurance Office** represents the department in matters regarding the National Accident Insurance Fund (Suva), a non-profit organization with authority concerning chemicals at the workplace.- The **Science and Research Group**, finally, is involved in research matters to be discussed later-on in this National Profile. It is also engaged in the interaction with another administrative body within the department, i.e. the Council of the Federal Institutes of Technology (ETH’s), and the latter are running a number of institutions dealing with specific aspects of the handling of chemicals (especially radioactivity, materials testing, and water treatment).

DJP, Department of Justice and Police:
This department’s responsibility regarding chemicals is limited, but nevertheless, three of its offices deserve mentioning. The **Federal Office of Police** is generally engaged in prosecution and prevention of criminal acts, and the fight against illegal distribution of narcotic drugs is one of its priorities.- The **Federal Office of Metrology** is responsible for standards and calibrations of instruments, and this has an impact on the handling of chemicals.- Finally, the **Federal Institute of Intellectual Property** warrants the patenting of chemicals and contributes in this sense to the control of their trade.

DDPS, Department for Defence, Protection of the Population and Sport:
For this department too, chemicals are rather a side issue. But the **Central Office for General Defence** covers i.a. the topic of strategic supplies in view of extraordinary situations, and chemicals and especially fuels are playing an important role in this respect.- The **National Emergency Operations Centre** integrates around-the-hour measurements of radioactivity and also gets active in cases of chemical accidents or threats with far-reaching effects.

DF, Department of Finance:
The **Federal Customs Administration** is, of course, providing control of imports and exports of chemicals. Thereby it contributes to the enforcement of health- and environment-related legislation.- The **Federal Alcohol Administration** controls the trade in ethanol which is specifically taxed and which is denatured for technical applications.

DEA, Department of Economic Affairs:
The **State Secretariat for Economic Affairs** is facilitating international trade in general, which includes international trade of chemicals, as well as the implementation of export control measures in order to reduce proliferation. It is in collaboration with the Directorate for International Law (DFA), the Federal Office for Public Health (DHA), the Central Office for General Defence (DDPS), the Federal Customs Administration (DF), or the Swiss Agency for the Environment, Forests and Landscape (DETEC) handling trade restrictions regarding classes of chemicals involving specific risks or international concerns. Furthermore, it is assuring protection of employees in a legal sense and is promoting a balanced development of the economy including chemical production and trade.- The **Federal Office of Agriculture** is playing an important role especially with regard to use and handling of pesticides and fertilizers. It is involved in the control of the respective professional training requirements, in the registration or notification of products, and in the promotion of a safe agricultural production. It keeps in touch with food processors and with consumer and environmental protection organizations.

DETEC, Department of Environment, Transport, Energy and Communications:
This department has again manyfold chemicals-related responsibilities. The **Federal Office for Transport** acts as the supervisory body of public transport and licensed transport companies.- The **Federal Office for Civil Aviation** takes care, i.a., of international agreements regarding air traffic and including air transportation of goods.- The **Federal Office for Water Management** has indirect chemicals-related responsibility by controlling corrective measures interacting with the natural flow of waters.- The **Swiss Agency for the Environment, Forests and Landscape** has to protect all the dimensions of the environment against excessive pollution. It is implementing the respective laws in collaboration with cantonal authorities and also involved in the registration or notification of environmentally hazardous products.- Finally, the **Swiss Federal Railways** have responsibility for their transports including the large transportation volume of chemicals. They have specific authority in terms of implementing the Ordinance on Protection Against Major Accidents.

6.3 EKAS – Important Example of a Coordinating Body

Switzerland's federalistic structure asks for distinct coordinating efforts, and some are actually foreseen in the federal legislation. EKAS (Eidg. Koordinationskommission für Arbeitssicherheit = Swiss Coordination Committee for Occupational Safety) provides an example. It is subject to the Federal Council's direct control and comprises the State Secretariat for Economic Affairs, the Cantons' Labour Inspectorates, the Swiss National Accident Insurance Fund (Suva), and professional organizations like SVTI (the Swiss Association of Technical Inspectors). Its main role is to coordinate the measures for preventing occupational accidents and diseases. In other words: it coordinates the implementation of two federal laws addressing this topic, the F.L. on Insurance Against Accidents and the F.L. on Work in Industry and Trade. Finally, an EKAS-subcommittee is responsible for specific chemical risks [53].

6.4 Comment on the Cantons‘ Chemicals-related Organization

The Cantons have to implement many federal regulations, while they are very free in organizing themselves. Nevertheless, there are organizational similarities resulting from the logic of the subjects addressed. Thus, the Cantons are essentially charging specific cantonal inspectors or chief employees with the implementation of the most important laws, ordinances, and derived regulations. This results in the following simplified picture [38, 41, 54]:

- The **Head Chemist** of the cantonal laboratory is in charge of implementing the Federal Law on Food and Consumer Products (Table 2, Annex I). His (her) laboratory is mainly inspecting food and consumer products and has the right and the duty to get samples from the market. In addition, it is in many cases controlling the quality of drinking water as well. The same laboratory is in smaller Cantons providing analytical services to the other offices charged with aspects of the management of chemicals. Normally, the head chemist and his (her) organization are belonging to the Canton‘s ministry for health.
- The **Head Pharmacist** too is usually belonging to the Canton‘s ministry for health. He (she) is controlling pharmacies and implementing IKS-recommendations as well as federal laws concerning medicines, e.g. the Federal Law on Narcotics and Psychotropic Drugs.
- The Canton’s **Head of the Poison Inspectorate** is in charge of implementing the Federal Law on Toxic Substances and the respective ordinance, and he (she) may be part of the Canton’s ministry for health. His (her) duties include the control of the permits of companies or individuals handling toxic substances and of the fluxes of toxic products and especially their imports as communicated via the Federal Office for Public Health by the Federal Customs Direction. In many Cantons this office is merged or tightly collaborating with the one to be mentioned next.
- The Canton’s **Environmental Inspectorate** may be subdivided into offices responsible for the control of air pollution, of waters, and of wastes, and these offices may be supported by their own laboratories. They are, e.g., in charge of the implementation of the Ordinances on Environmentally Hazardous Substance, on Air Pollution Control, and on Environmental Acceptability Studies, as well as the Law on the Protection of Waters. They may be merged with or organizationally separated from the office implementing the Ordinance on Protection Against Major Accidents, and they may belong to the cantonal ministry for economy, the ministry for construction (if the emphasis is on environmental impact assessments and respective construction permits), to other ministries, or even to more than one.
- The so-called cantonal **Safety Inspectorate** has implicitely been mentioned above (office implementing the Ordinance on Protection Against Major Accidents). It is not normally separated from the other offices dealing with aspects of environmental protection, but it may, and it is in these cases having a strong focus on the control of the transportation of chemicals and on the respective risks. Logically, it is then integrated in the Canton‘s ministry for police and related matters.

- Other cantonal offices at least partly involved in the management of chemicals are the **Office for Industry, Commerce and Labour**, the **Office for Agriculture** which also may represent a ministry on its own, and the **Direction of the Police Forces** which normally appoints the chief of staff in cases of chemicals-related crisis situations and which has a standing inter-ministerial organization ready to cope with this type of events.- The first of the offices mentioned in this paragraph is involved in the granting of permits for industrial operations and in the protection of workers, while the second is playing a role with regard to the handling of pesticides or fertilizers and with regard to granting the respective professional approvals.

Of course, the above compilation gives no more than a sketchy impression of the governmental organizations managing chemicals in the 26 Cantons. But it gives a good impression of the very significant efforts made to implement the relevant laws and ordinances. In addition, it underlines the strong need for collaboration to be addressed in chapter 8.

To be mentioned here, however, is one important further point. It regards the Cantons‘ authority and right to get informed and the companies‘ obligation to comply and provide information. Both are significant, and both are warranted by a number of administrative control mechanisms. They include the following:

- All companies have to in general terms describe their business and to get registered as from a turnover of SFr. 100 000.-/year. Responsible is the Canton’s commercial registration office [55].
- All companies‘ have to maintain orderly book-keeping and to periodically turn in their value added tax declarations as from an even lower turnover (specifically defined and exceptional higher limits cannot be the subject of this National Profile). The Federal Tax Administration is directly responsible in the latter case [56].
- All companies have to file information on their employees with the Canton‘s office responsible for social security and with the office responsible for the employees‘ insurance (the National Accident Insurance Fund, Suva) – and the Cantons may, of course, take a decentralized approach to handling these matters. Connected with the topic is the Cantons‘ right to get data and perform inspections addressing occupational safety and health.
- Companies handling toxic chemicals have to register as such and have to define their professional(s) in charge.
- Companies intending to produce chemicals or to handle them in relevant amounts have to carefully judge the related risks and have to turn in their risk assessment to the Canton which then decides upon the necessity of a formal environmental impact assessment.
- Companies handling chemicals have, of course, to respect the environmentally relevant federal legislation and to prove that they are in control. Thereby the Cantons have the right to double-check the results by performing measurements on their own, if required, and they have the right to order corrective measures or to even close down the operation, if the company isn’t taking action within acceptable limits of time – and the latter have to be fixed in

accordance with the law and in due consideration of the company's economic and general situation.

These administrative mechanisms as described in no more than a summarizing manner are providing a wealth of information which could damage the companies' competitive situation, if it were public, and that is the reason for the already mentioned confidentiality and respect for powers reserved.

CHAPTER 7: RELEVANT ACTIVITIES OF INDUSTRY, PUBLIC INTEREST GROUPS AND THE RESEARCH SECTOR

7.1 Description of Organizations

The chemical industry is amongst the four most important ones in six Cantons, and it is the major industry in the two Basels and in the Valais (table 1.E, page 34). Altogether there are slightly more than 900 Swiss establishments with more than 65 000 employees belonging to the chemical industry according to the count of the Federal Office for Statistics (table 1.F, page 35). This implies that there is not only a large need for, but also a high availability of chemical professionalism. But there are additional industries or professional groups dealing with chemicals and interested in their management. E.g., there are the industry casting and refining metals and the industry making leather, rubber, and plastic products, there are the organizations refining and distributing fossile fuels, and there is the whole medical sector. Finally, the leading chemical companies are multinationals headquartered in Switzerland and represented on all the continents, which results in enormous exposure and experience.

The following is quite generally characterizing the **large chemical groups** [57]:

- they direct very significant international fluxes of chemicals;
- they have important group functions in Switzerland; this is normally including a group function safety and environment;
- they have safety laboratories supporting the mentioned group functions;
- they have sophisticated analytical departments supporting not only their quality assurance and research, but also their safety labs;
- they have group-wide electronic information networks;
- they have fire brigades which are trained and equipped to fight chemical accidents and which are everywhere integrated in the municipal and regional crisis management concepts;
- they are represented in all the important respective national as well as international industrial and professional organizations;
- they make significant contributions to the financing of these organizations;
- they have tight research links with Swiss as well as foreign universities; and
- they have a vital interest in an optimum management of chemicals at all levels and in complying with the legal requirements.

The **smaller chemical companies** are in essence taking a comparable approach – of course, with less international and national exposure, with significant accumulation of responsibilities of given managers, with much more out-sourcing (e.g. of safety investigations of chemical reactions), and with more emphasis on professional representation by SSCI, the Swiss Society of Chemical Industries.

SSCI is the main Swiss **industrial association** of the chemical industry. It is itself represented in international organizations like CEFIC, the Conseil Européen des Fédérations de l'Industrie Chimique, and it is a kind of focal point in the interaction of

the Swiss authorities and the Swiss chemical industry. It also provides additional links between industrial and professional associations interested in the management of chemicals and between the chemical and the other Swiss industries (e.g. through representation in the so-called VORORT, the Swiss Society for Industry and Trade). In addition, it integrates some of the joint chemical industries‘ interests in specific programs and focal groups. Finally, there are, of course, specialized industrial associations within the Swiss chemical industry, which normally have their own legal identity and which usually belong to the corresponding specialized international organization. E.g., there are Swiss societies belonging to

- the European Crop Protection Association (ECPA),
- the European Federation of Pharmaceutical Industries‘ Associations (EFPIA),
- the European Flavour and Fragrance Association (EFFA),
- the Fédération Européenne du Commerce Chimique (FECC),
- the Fédération Européenne de la Santé Animale (FEDESA),
- the Fédération Européenne des Fabricants d’Adjuvants pour la Nutrition Animale (FEFANA),
- the International Federation of Pharmaceutical Manufacturers‘ Associations (IFPMA),
- the International Fragrance Association (IFRA), and
- the International Organization of the Flavour Industry (IOFI).

SSCI, the Swiss Society of Chemical Industries, provides a possible point of access to all the respective Swiss Societies [19].

Professional Associations [58] are a next group of organizations to be mentioned in the context of the management of chemicals. The Swiss Academy of Natural Sciences is especially integrating the professional domains concerned with research, and the New Swiss Chemical Society, Geneva, is one of its prominent members. It has subgroups like, e.g., the Swiss Society for Analytical Chemistry. These members and subgroups of the Academy are again represented in numerous international associations, and they are a key element with regard to contacts between industry and universities, on the one hand, and between research and funding organizations, on the other. They are also editors of journals like Helvetica Chimica Acta and Chimia, the two most prominent Swiss carriers of information about chemical research. But there are also non-academic professional associations like the Swiss Society of Laboratory Personnel, which edit their own journal and which play an important role in view of fostering a professional and safe management of chemicals.

The **Union** of the workers in the textiles, paper and chemical industries is a professional organization too, of course. It contributes to the safe management of chemicals by pursuing, i.a., occupational health issues. The organizational body covering it is the Swiss Federation of Unions (Schweizerischer Gewerkschaftsbund, Bern).

Universities and Technical Colleges are another important element in the landscape of organizational bodies concerned with the safe management of chemicals. They do this especially by pursuing research programs and by identifying the

problems of tomorrow. Nevertheless, their impact is important and can be imminent and vital. In addition it is not restricted to the chemical faculties alone. Thus, the Federal University of Economy and Trade in St. Gallen (HSG) has been pioneering research on environmental incentive taxes, and the Federal Institutes of Technology (ETH) in Zürich opened up its Environmetal Science Faculty more than ten years ago. But the role of the classical chemistry departments should anyway not be neglected, and the scientific sister disciplins (like molecular biology on one and chemical engineering on the other side) should be duly considered when attempting to assess the role of universities in the context of the management of chemicals. The following universities have chemistry faculties (technical colleges not considered):

- Zürich (University and ETH)
- Bern
- Fribourg
- Basel
- Lausanne (University and ETH)
- Neuchâtel
- Genève.

Next, there are **consumer organizations, public interest groups (registered federations and clubs), and government-funded organizations**, which mostly focus upon specific aspects of chemicals management through concentrating on specific dimensions to be protected. Naming all their roles and interests would go beyond the scope of this chapter, but the following exemplary list shall give an impression and illustrate their networking function:

- Stiftung für Konsumentenschutz, Bern, SKS (Foundation for Consumer Protection),
- Greenpeace Switzerland, Zürich, GPS,
- Verein zur Förderung der Wasser- und Lufthygiene, Zürich, VFWL (Federation Fostering Purity of Waters and Air),
- Pro Natura, Basel (the Swiss Federation for the Protection of Nature),
- Gesellschaft der Ehemaligen Studierenden des Polytechnikums, Zürich, GEP (Association of Former ETH-Students),
- Schweizerische Gesellschaft der AC-Schutzoffiziere (Swiss Society of Officers for Protection Against Nuclear and Chemical Warfare).
- Schweizerischer Nationalfond zur Förderung der wissenschaftlichen Forschung, Bern (Swiss National Foundation for scientific Research)
- Expertenkommission für Sicherheit in der chemischen Industrie der Schweiz, ESCIS (Swiss Commission of Experts for Safety in the Chemical Industry).

The more complete list in Annex IV is supplementing the above arbitrary selection.

Finally, there are **commercial research and management organizations** as well as **governmental research institutes** contributing to the safe management of chemicals. They are at least in part addressed in chapter 10.

7.2 Comments and Summary of Expertise Available Outside of Government

Table 7.A (page 79) is summarizing the situation. It is in essence organized according to UNITAR's guiding document and attempting to present the weight of the impact of the different organizational bodies by classifying them as more important (**XX**) or less important (**X**) in view of the management of chemicals.

Obviously, subchapter 7.1 is already giving an impression of the very significant expertise available outside of government, and in many cases this expertise is actually going beyond the one available with strictly governmental organizations. Therefore, one comes to the conclusion that the availability of information and expertise is rarely the problem. The problem is rather their being available at the right point in time and with the right bodies. Thus, it boils down to facilitating communications, to fostering alerting mechanisms, and to overcoming confidentiality barriers or dealing with property rights. These are tricky endeavours which certainly cannot be solved in one general and internationally applicable way. Therefore, it shall now be tried to characterize the specific Swiss limiting conditions and solutions.

One of the favorable limiting conditions characterizing Switzerland is based on its long-lasting federalistic tradition. It has resulted in a sophisticated political culture of identifying joint interests, of providing the necessary means to cope with them, and of at the same time respecting the confederates' properties and right to independently deal with their internal affairs. This kind of thinking has been translated to newer domains and is certainly having an impact on the Swiss management of chemicals and of the required expertise. Thus, cantonal institutions are getting extremely detailed information from industry, e.g., when investigating environmental acceptability data or when measuring emissions of chemical production entities. But such data cannot be entered into a common federal file continuously – for reasons of confidentiality as well as practicability. Therefore, they are usually kept at the cantonal level, and only the conclusions or the important or extraordinary elements are forwarded to the Swiss Agency, while the latter makes sure that comparable approaches are taken by the Cantons.

A similar situation has already been discussed with regard to the composition of all the commercial products containing toxic chemicals. Here, there is a national file with the Federal Office for Public Health, but this file is confidential and accessible only to the authorities in charge of the implementation and to the Toxicology Information Center in Zürich. However, the lists of toxic substances and products (poison lists 1 – 3) are accessible to any organization with an interest in the point. Finally, the Cantonal Chemists are, of course, getting all the information they need in pursuing their mission [21].

A second favorable limiting condition characterizing Switzerland regards its being a small country with a long tradition of militia. Again, this has had a strong impact upon aspects of modern Swiss civilization. Thus, chemists from federal offices and from in-

dustry are meeting in professional associations or in courses, which facilitates informal discussions and sharing of views.

Finally, there are many government-funded or semi-governmental institutions facilitating the exchange of information between private and public domains. Thus, all the Swiss universities are cantonal or federal (the latter holds for St. Gallen and the two ETH's), and some important institutes belong to the ETH-domain: e.g. EAWAG (Eidg. Anstalt für Wasserversorgung, Abwasserreinigung und Gewässerschutz, Dübendorf, Swiss Federal Institute for Environmental Science and Technology) and the Toxicology Institute in Schwerzenbach, Zürich, representing a joint venture with the Zürich University [74]. Nevertheless, a liberal practice is pursued in view of their collaborating with industry and signing confidentiality agreements as long as the latter are not in opposition to their status.

In summarizing the above, one might say that there are many instances of joint public and private interests and of a joining of forces, while there still is the adequate and strict separation of industry and public inspectors on the one hand and of private and public information on the other.

The whole discussion has certainly been somewhat theoretical up to here, and actual programs have not been mentioned. This is hopefully understood in view of the complexity of the field. Nevertheless, a small selection of specific activities from the SSCI 1997 Annual Report shall now be cited in the end. They give no more than an arbitrary illustration and shall just be compiled in telegram style [19]:

- Contribution (via CEFIC) regarding MAI (multilateral agreement on protection of direct investments) negotiated within OECD - a crucial instrument warranting the legal protection of investments in world-wide state-of-the-art installations ensuring professional handling of chemicals.
- Participation in the delegation negotiating the details of the PIC-Convention (Prior Informed Consent) in conferences in Rome and Geneva attended by more than 100 country delegations.
- Pursuing the liberalization of Swiss trade in industrial alcohol.
- Publication of 1993 – 1996 core data from 70 companies participating in the Responsible Care Program.
- Judging the consequences of about 20 new federal ordinances re. safety, health, and environmental protection. Supporting companies' compliance.
- Assisting and representing member companies in view of protecting their interests re. the new VOC-incentive tax.
- Participation in workshops and transmittance of members' contributions re. the OECD-test guidelines and international harmonization.
- Information meeting with experts re. the draft ordinance on historical dumping sites.
- Efforts to simplify and harmonize the regulations re. transportation of dangerous goods on rails and streets.
- Pilot course for safety consultants in transportation of dangerous goods.
- Participation in the discussion of the draft of a new Federal Law on Drugs.

Table 7.A: Summary of Expertise Outside of Government

Field of Expertise	Research Institutes incl. Quasi-governmental	Universities	Industry	Environment & Consumer Groups	Labor Unions	Professional Associations	Industrial Associations
Data Collection	XX	XX	XX	X	X	X	XX
Testing of Chemicals	XX	X	XX				
Risk Assessment	XX	XX	XX	XX	X	XX	X
Risk Reduction	XX	X	XX	X	X	X	X
Policy Analysis	X	XX	XX	XX	XX	X	XX
Training & Education	X	XX	X		X	XX	X
Research on Alternatives	XX	XX	XX			X	
Monitoring	XX	X	XX	X		X	X
Enforcement	X		X	X	X	X	XX
Information to Workers	X		XX		XX	X	X
Information to Public		X	X	XX	X	X	X

Remarks:

Most of the above assignements of weights are self-evident, and it is sufficient to refer the reader to the list in annex IV. Some others require additional consultation of chapter 9 (re. especially the first three columns). Finally, the following points shall be commented upon here:

- Data Collection has the higher weight for Industrial than for Professional Associations. The reason is that the former may be compiling data for members only, while the latter are usually publishing results and relying on internationally available data files.
- Risk Assessment is more important than Risk Reduction for Environment/Consumer Groups and for Professional Associations. Reason: The latter requires political will, expertise, and technical means, and the last element is missing within the two groups.
- Policy Analysis is given a low weight for the more technology-oriented Research Institutes and Professional Associations, while it gets a high weight for universities. This addresses specifically the economy and environmental science faculties.
- The high weight given to Enforcement in the column Industrial Associations is underlining their role in discussions with federal offices and in translating new ordinances into practicable industrial approaches.

7.3 Establishing a Chemical Business or Industrial Activity

Switzerland has a certain reputation as a „tax paradise“ – and this may be attracting business or at least make foreign investors consider establishing parts of their industrial activity in the country. Therefore, it makes sense to address the point in the National Profile – on the one hand, perhaps, to eliminate the misconception that everything is possible, and on the other hand, to provide some information to those who are pursuing the idea on serious and multi-factorial grounds and who are correspondingly faced with a comparatively complex administrative system.

Of course, there are advantages and disadvantages in every decision on industrial sites. This holds for Switzerland like everywhere else. In addition, Switzerland is quite inhomogenous in view of, e.g., the geographic and demographic situation of the individual Cantons and in view of their administrative approaches. Nevertheless, it can be said that, overall, the Cantons

- are interested in attracting business and industrial activities to safeguard employment as well as tax-income,
- are obliged and determined to take care of their landscape and cultural values and to promote the principle of sustainable development in the broadest sense of the word,
- may, of course, not exempt start-up companies or new subsidiaries of existing industrial groups from compliance with the laws, but
- may, in fact, within the framework of the specific cantonal legislation and in applying the rules of a respective concordate grant tax incentives to businesses to be founded or industrial activities to be established.

It cannot be the purpose of this short chapter to repeat the differences characterizing the individual Cantons, which are addressed in chapters 1 and, e.g., 10.4. In addition, the decision regarding a new site depends on the given project which may require qualified personnel, the neighbourhood of an airport, presence in a specific Swiss market, low-cost energy, or a large piece of land, etc. Therefore, it shall just be underlined that throughout the country the federal taxes and legislation are, of course, the same, and the reliability of the workers and the infrastructure is high. Finally, **all Cantons have an office or agency assisting the establishment of new businesses or industrial activities**, **and** they also have private organizations like **a chamber of commerce** providing contacts and support.

The mentioned offices or agencies are in most cases integrated in or liaised with the Canton’s ministry of economy. They know about the specific opportunities within the Canton, and they normally deliver at least the initial service at no cost.

The **Canton Basel** (BS and BL) shall now as an example be discussed in somewhat more detail – because the Basel region has the strongest chemical industry in Switzerland. It homes quite a number of subsidiaries of foreign (especially European) companies, and it has in two respects its own, specific approach to business development:

There is a joint **Business Development** for the two half-cantons.

- This unit which may, but does not have to be contacted, of course, has a semi-governmental status (it is jointly owned by the two half-cantons and by private organizations).

The Basel Business Development [59] has in 1998 assisted some 160 parties interested in founding a business or establishing an industrial activity within the Canton's borders. The larger part of these projects have in the meantime been abandoned, some are still under way, and some have come to completion. Interested parties ranged from big international groups to individual entrepreneurs, and tax incentives were not the driving force of the interest as Basel rather promotes other advantages:

- the region's „critical mass" regarding science and technology,
- the locally available and huge potential as represented by the pharmaceutical companies headquartered in Basel,
- the available infrastructure,
- the administration's respective experience,
- the situation in terms of international traffic,
- the availability of qualified personnel (includes commuting across the national border),
- etc.

Thus, Basel has succeeded in maintaining a strong position as prosperous industrial Canton in spite of or possibly at least in part even thanks to its precise cantonal legislation regarding chemicals and the environment [60]. Nevertheless, Basel remains with all its individuality a typical Swiss Canton, and the steps to be taken in developing a chemical business are very comparable throughout Switzerland. They are in a summarizing way compiled in the frame on this page.

The main first steps to be taken in establishing a chemical activity or production site:

1. **Define the key aspects and requirements of the project.**
2. **Take a provisional decision regarding the Canton to go to.**
3. **Preferrably contact the Canton's business development unit at that stage.**
4. **Take the final decision regarding the Canton and decide on the legal form of the company (one does not have to be Swiss to found a company, but one has to have a Swiss address – initially, e.g., in a rental relationship).**
5. **Register the company with the Canton's business registration office.**
6. **Contact the owners of the land or property and the respective community regarding zoning plans (foreigners wanting to own land have to have a permit, which is facilitated in case they establish an industrial activity).**
7. **Document the project in more detail.**
8. **Contact the Canton's office for industry and trade in view of the permit to pursue an industrial activity.**
9. **If required, contact the same office regarding working permits and the police for foreigners regarding residency.**
10. **Submit the details regarding risks, processes and all stocks and fluxes of chemicals to the Canton's environmental protection agency.**
11. **Submit the plans regarding construction or building adaptations to the Canton's construction department.**
12. **Report employees to the Canton's offices for employment and social security.**
13. **Report the authorized person in charge of handling toxic substances to the Canton's poison inspectorate.**

CHAPTER 8: INTER-MINISTERIAL COMMISSIONS AND COORDINATING MECHANISMS

8.1 Overview

Before addressing coordination mechanisms one might ask, what there is to be coordinated regarding the management of chemicals. There are four main topics:

- the development of legislation and the negotiation of new treaties (I),
- the implementation of legislation and treaties – especially in non-routine cases and in view of just and comparable handling of comparable matters (II),
- the constant improvement of the available instruments for control and enforcement of legislation or for identifying and analyzing new concerns (III), and
- the handling of major accidents requiring quick and substantial help or having a far-reaching impact (IV).

Table 8.A is referring to these four types of situations (I – IV) which, of course, are quite dissimilar with regard to urgency and possible approaches.

Table 8.A: Overview of Inter-ministerial and some Parliamentary Commissions and Coordinating Mechanisms [4, 61]

Name of Mechanism	Involved Bodies or Individuals	Secretary	Legislative Mandate or Objective	Type of Situation (I – IV) and Remarks
Weekly Meetings of the Federal Councillors	F. Councillors & Federal Chancellor & Vice-Chancellors	Secretary of the F. Council (part of F. Chancellery)	Executive government – implementing the F. Constitution (not in isolation)	I: Stipulate and / or prepare parliamentary discussion of laws. II: Approve important new ordinances. III: Decide on managerial departmental interactions.
Parliamentary Commission Meetings	Members of steady or *ad hoc* Parliamentary Commissions of both councils	Secretary of the resp. Parliamentary Commission	Preparing Parliamentary Decisions on legislation	I: Discuss F. Council's proposals, prepare parliamentary discussion or conciliation, if National Council & Council of States disagree. III: Discuss Parliamentary Initiatives.
Parliamentary Party Group Meetings	Parliamentary members belonging to the given parties	Secretary of the resp. Party Groups	Get ready for parliamentary debate	I: Formation of opinion. III: Sipulate or discuss Parliamentary Initiatives.
Parliamentary Sessions	National Council or Council of States (concerned F. Councillors attend)	Secretary of the resp. council	Decide on laws or constitution and related mechanisms	I: Votes on laws and treaties (**proviso: referendum and public vote**). II: Votes on Parliamentary Motions etc.

Table 8.A (continued)

Name of Mechanism	Involved Bodies or Individuals	Secretary	Legislative Mandate or Objective	Type of Situation (I – IV) and Remarks
Considering Need for New Legislation – Committees Appointed by the F. Council	Committees appointed *ad hoc* (usually incl. members from F. offices, academy, etc.)	Secretary of involved F. office or from F. Chancellery	Study scopes and limits – make proposal	I, III: Discussion of new concerns. Elaboration of concepts. Eventually getting a first draft to be submitted to hearings, revised by the F. administration, verified by the F. Council (weekly meeting), and proposed to the two chambers sequentially.
Hearings on New Laws/Constitutional Articles – Consultation	Governments of the 26 Cantons, political parties, professional/industrial associations, other interested groups	List proposed by F. office(s)	Getting agreement before deciding	I: Drafts are circulated; corrections & remarks arriving in writing before deadline may be considered in the course of the above-mentioned revision or verification.
Conferences of Cantonal Ministers	Ministers representing a given field (e.g. health) meeting *ad hoc* or routinely	Secretary from the ministry of the actual President of the Conference	(In)formal managerial coordination – may be based on concordate	III: Identification & discussion of joint concerns – eventually followed by actions in the concerned Cantons.
Coordination between F. Offices and Ministries of the Cantons (periodical or *ad hoc*)	Heads or members of depts. within F. offices & representatives of cantonal ministries	Secretary from F. office concerned	Assistance in view of interpretation of new laws..., discussion of factual concerns	II: Discussion of implementation problems or need for departmental ordinances, identification of priority concerns. III: Practical coordination & decisions (e.g., on labs taking the lead or on round robin tests).
Coordination within F. Administration (periodical or *ad hoc*)	Heads of F. offices or dpts. within them as appointed by F. Councillors; ev. addtl. experts	Secretary from leading F. Department or office	Improving functioning & coherence of administration	III: Regards, e.g., DEA, DF, & DDPS and imports of strategic goods or goods useful for military & civil purposes. **Cp. table 6.A.**
Staff F. Council – National Emergency Operations Centre, NEOC (= NAZ)	Members from F. Council & NEOC incl. Swiss Meteorological Establishment	Secretary from Natl. Emergency Operations Center	Fast action at national & international level; Ord. on Protection Against Major Accidents	IV: Events of smaller impact may be handled by the crisis staff of individual Cantons.

8.2 Coordination in view of Prevention or Limitation of the Consequences of Major Accidents [41]

Coordination in terms of developing and enforcing legislation and of getting the necessary consent has already been discussed extensively and under different points of view in the preceding chapters. Therefore, the focus shall now be on major chemical accidents, on preventing them, and on limiting the damage they cause.

The Ordinance on Protection Against Major Accidents is not only defining approaches to avoid accidents, but also addressing provisions to minimize their consequences, once they have happened. Thereby it obliges the Cantons to coordinate

- the preventive controls of facilities presenting a certain risk and
- the activities of the rescue squads with the planning of the management of the concerned operation.

Efficient coordination requires clear situations with regard to empowerment. On the one hand, this implies a coordinating function of the Cantons. On the other hand, it defines the Confederation's right of enforcement of federal laws throughout Switzerland. Thus, Suva-inspectors may visit companies everywhere and order improvements in the light of the Federal Law on Insurance Against Accidents (the workers' mandatory insurance). Nevertheless, they will often voluntarily contact the Canton as the latter is responsible, e.g., for the implementation of the law on employment (on work in industry and trade). Furthermore, there is a clear separation of responsibilities in the sense, that safety risks within a given facility are subject to the legislation on occupational health and that safety risks concerning the surroundings are to be handled according to the Ordinance on Protection Against Major Accidents... and the combined risk assessment has to be available with the Canton.

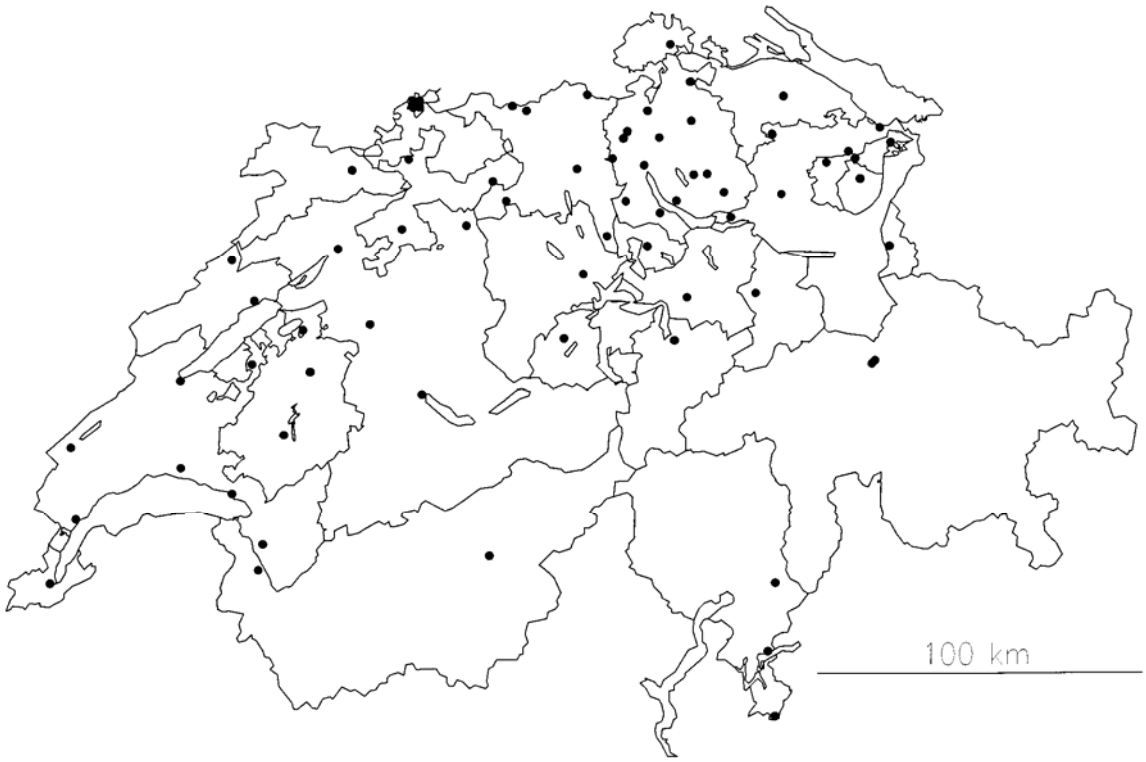
But empowerment is futile if the responsible body in charge is not here to act in the case of an event. Therefore, the **cantonal crisis management** plans are quite generally foreseeing the following „ideal" sequence of assignments, which shall here be illustrated for the case of a major event initially involving the local fire department:

- First, the owner or responsible manager of the conerned facility is in charge of the crisis management. He (she) immediately informs the alert center of the Canton and works according to his (her) check-list for crisis management up to the arrival of the commander of the local fire department.
- The Canton's alert center informs ARMA, section of the Swiss Meteorological Establishment functionally reporting to the National Emergency Operations Centre, which, depending on the case, gets ready for further action.
- After his appearance on the scene the commander of the municipal fire department is in charge of the crisis management and empowered to demand assistance from neighbouring fire departments etc.
- Upon his arrival the representative of the cantonal police takes over, and the responsibility goes up the hierarchical ladder of the cantonal police forces. Eventually, the head of the cantonal police or his deputy is in charge and hands over to the head of the Canton's crisis management staff, who then remains responsible for all the aspects which have no impact beyond the Canton's borders.

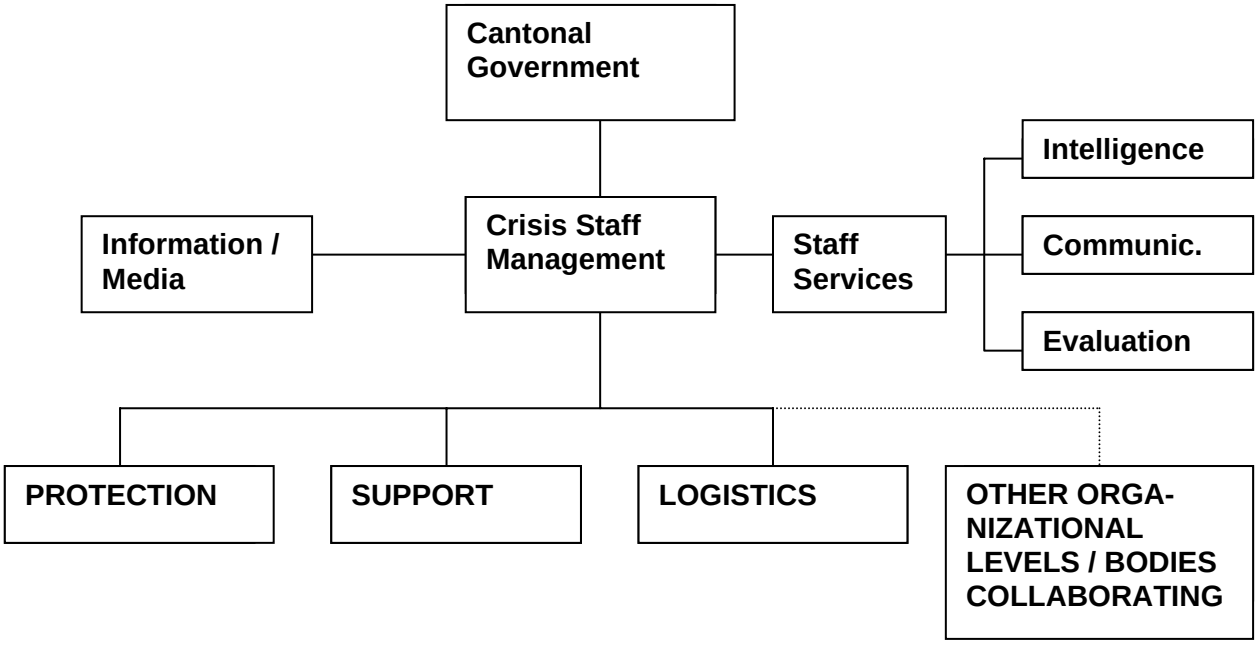
Here, a number of remarks have to be added:

- Of course, the responsibility does not necessarily have to be passed on along the full ladder described, and short-cuts are possible. In addition, the person in charge always stays on to support the successor taking over.
- Chemical accidents of a nation-wide basic dimension are in essence inconceivable, but aspects may have such a dimension – especially if waters are quickly distributing poisonous substances. Thus, the Staff Federal Council – National Emergency Operations Centre is rather ready for nuclear accidents but may, nevertheless, become active in view of intercantonal or international consequences of chemical accidents; and theoretically, it could even in the case of chemical accidents take the crisis management responsibility.
- Intercantonal and international interactions are in principle always handled by the respective federal authorities, but there are direct assistance or alerting agreements between neighbouring Cantons, on the one hand, and between Cantons at the federal border and the neighbouring Provinces of foreign countries, on the other hand, in order to speed up things.
- The type and quality of housing encountered in Switzerland as well as the warning systems available are favoring the protection of the population against chemical accidents and simplifying the coordination task.
- There are firebrigade bases with special equipment for the response to chemical accidents. These bases are distributed over the country as illustrated by the following figure.

Distribution of Firebrigade Bases with Special Equipment for the Response to Chemical Accidents [62]



The cantonal crisis management staffs are to some extent individually structured, but the similarities are dominating, and the Federal Office for Civil Defence is playing a role in terms of fostering a coherent approach to crisis management. The following organization chart is illustrating the general approach. It is based on the actual case of the Canton Basel Landschaft (BL) [63].



The department Protection within the above organization includes the section Police, the section Nuclear and Chemical Risks, the section Environment, Technology, and Energy, the section Laboratory, and two sections Construction Engineering. In addition, all the departments are foreseeing ad hoc groups as adequate in the actual case. Other Organizational Levels/Bodies foreseen include the Swiss Confederation, the Neighbouring Cantons, the Municipalities, the Neighbouring Countries (provinces), the Military Logistics and Support Regiment appointed to the area, and a series of defined civil organizations.

CHAPTER 9: DATA ACCESS AND USE

9.1 Introduction

UNITAR's guiding document is foreseeing in this chapter a very detailed description of the type of available data, of their location, of the procedures for collecting and disseminating the respective information, of the availability of literature and international databases, and of the information exchange systems. This would result in too many details – especially in view of the rapid pace of development of modern information technology. Therefore, it was decided to not too strictly adhere to the guiding document in this chapter, to keep it short, and to only present the principles and general approaches.

9.2 Local and National Data

Data regarding the local management of chemicals concern

- storage of types and amounts of chemicals at given locations,
- types of chemical transformations performed at given sites - incl. amounts, conditions, and control,
- emissions from local installations,
- wastes generated by local facilities,
- transport types and volumes along given local axes,
- local use – incl. resulting pollution,
- specific local measures to cope with given chemical risks, and
- specific local know-how which is neither published nor available in broadly accessible data files.

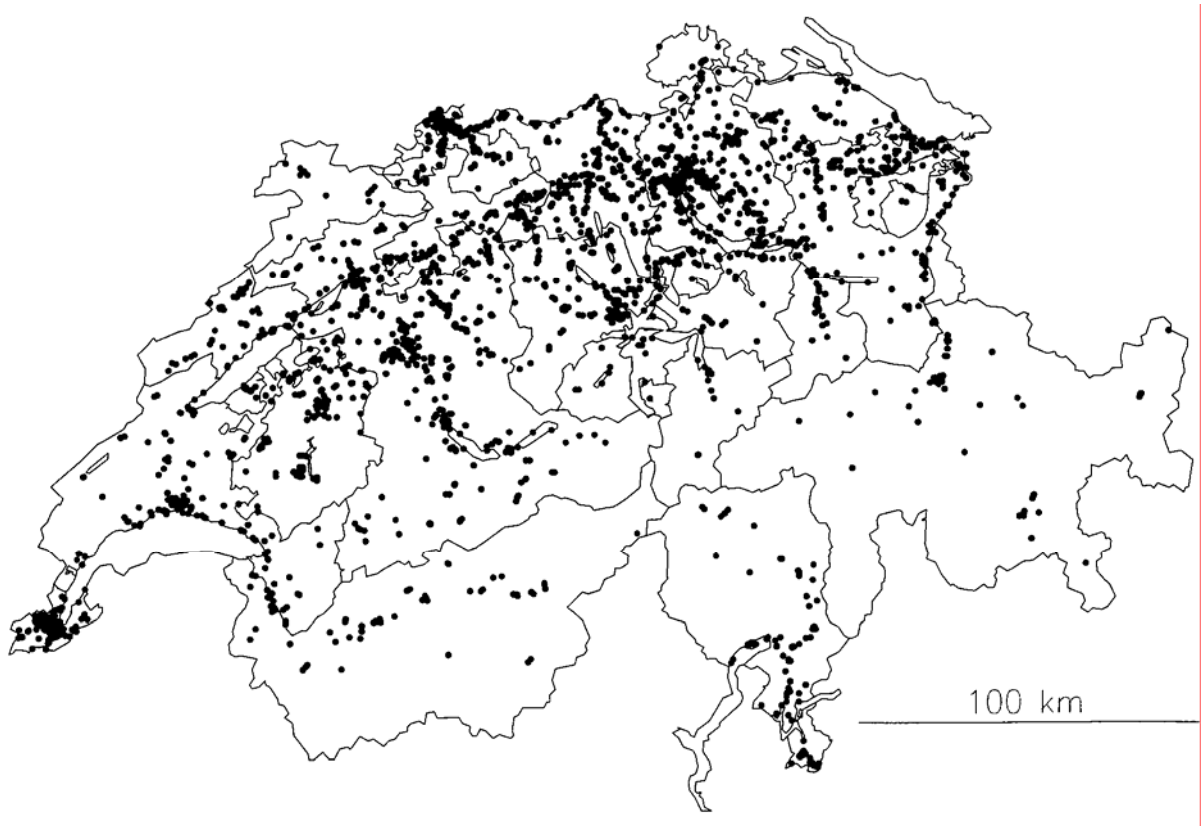
National data may be

- a sum, excerpt, or digest of local data,
- data which are available through national controlling approaches, or
- confidential data which are communicated to the national level only or which are generated by national institutions.

Now, there is no point in summing up details meaningful only at the local level, and the lowest level compiling data to be discussed is represented by the individual companies or facilities (in the following shortly referred to as companies). They have to comply with the already mentioned Ordinance on Environmental Impact Assessment and are in this context getting their own risk assessments. These assessments are reviewed and eventually checked by the Cantons, and a digest is forwarded to the Swiss Agency for the Environment, Forests and Landscape (SAEFL). Here, the so-called **risk register** (Eidgenössischer Risikokataster - see next page) is generated. It provides a strategic basis for preventive measures at the national level, and the details on which it is built remain confidential.

To be added is the fact that this register is, of course, covering chemical as well as „non-chemical“ facilities. E.g., in 1995 there were 68 facilities belonging to the chemical industry in the Canton Basel Landschaft according to the NOGA statistics, while no less than 343 were investigated in the course of the actualization of the risk register performed shortly before that date [64].

Federal Risk Register – Distribution of the Installations within the scope of the Ordinance on Protection Against Major Accidents [62]



Of course, the risks alone would present insufficient grounds to implement preventive measures. Therefore, the NAZ (National Emergency Operations Centre) is providing the Cantons with periodically up-dated information on dangerous substances (**IGS** = Informationssystem für gefährliche und umweltrelevante Stoffe, i.e. information system on dangerous substances), which is available on electronic data carriers. In addition, the federal geographic information system, **GEOSTAT**, must be regarded as an important covering or additional tool to manage chemical risks or to address environment-related questions [1]. It is available on CD or on-line, and it is being continuously improved by the Federal Statistics Office. It is in essence representing a map of the country (1:25 000), which not only contains the geographic elements incl. buildings and communications etc., but also the borders of all the municipalities, the population, the types of exploitation of the soil, the ground-water zones, the areas important for wild-life (nesting or resting grounds used by migratory birds etc.), and geological facts. Supplementary information is in addition available in some Cantons.

But there are details which are of transitory nature and of no general interest. They are kept at the company level. E.g., the concerned companies (those dealing with above threshold amounts of chemicals) have to always be in control of their **stocks**. They are normally having the data on a computer file which is up-dated no less than weekly, and the cantonal authorities have the right to control the correctness of the data.

The companies have to also control their emissions and to prove that they are within the limits of the Ordinance on Air Pollution Control. Again, the cantonal authorities are entitled to check up on the data. In addition, they keep their **emissions register** which is based on measurements and calculations regarding the individual companies, and the companies have to communicate operational changes which have a significant impact upon their emissions. The resulting digest obtained at the national level and compiled by SAEFL yields, e.g, an important element for getting the type of data presented in the figure on page 39 of this National Profile.

Special wastes represent another type of information which is summed up to provide a general picture, and the data compiled in table 2.C illustrate that exact figures are in this case available with SAEFL.

Other data are obtained as approximations. E.g., the use of **pesticides and fertilizers** isn't available as an exact summation of individual figures, but there are several elements which are yielding fair estimates overall. To be mentioned are the statistics as provided by the producers or their industrial association resp. the Swiss Society of Chemical Industries, SSCI, the exact data about imports and exports as available from the customs statistics, the usage data as resulting from questionnaires turned in to the Federal Society of Farmers, and the selective investigations as performed by the Agricultural Research Institutes.

Data about **transportation** include estimates as well. They combine the exact figures available for transports on rails (General Directorate of the Swiss Federal Railways – details not published) and the exact data regarding pipelines with the estimates regarding street transports. The latter are based on exact data as available from **customs** (cp. the already mentioned Swiss-impex file), on information given to the cantonal authorities by the respective companies, and on information resulting from street controls performed by the police.

Finally, there are the data resulting from federal control mechanisms. They include especially the **inventory of dangerous substances** (IGS, cp. page 88) and the files of **toxic substances** (lists of poisons, cp. chapter 5.2) generated by the F.O. for Public Health and available from EDMZ. They cover types of products and toxicity, but no amounts.Also important are the registration or notification data regarding environmentally **hazardous substances** available with SAEFL, the data on **occupational health and accidents** available with the National Accident Insurance Fund (Suva), the **reports generated by the Cantons' chemical laboratories**, the **results obtained by the different federal research institutes**, the results compiled by the Federal Statistics Office like those yielding the **economic index figures**, etc.

All the mentioned information is in principle available from the institution concerned, a lot of it is published, and quite a bit is accessible via electronic data carriers (e.g. via Internet connecting the cantonal laboratories), but the authorities are always respecting the confidentiality of specific data about individual companies, if the companies are not themselves publishing the details.

9.3 Libraries and Databases

Libraries and databases are providing information, and the first question to be raised in the context of the management of chemicals is the following:

Are the available libraries and databases containing the relevant information?

The answer is a simple „yes“, and every attempt to provide the details has to remain fragmentary. This might be illustrated by the fact that, e.g., the library of ETH (the Swiss Federal Institute of Technology), the largest technical library in Switzerland and at the same time the largest overall, had in 1996 more than **five million units** (i.e. „books“ = issues of journals or series as well as monographs – thereof 2 million available on microfilm only) [65]. Thus, the library of ETH was at that time holding about 11 000 journals and 23 000 series, and that was and is not all of the published information of technical-scientific and related orientation available in Switzerland. Therefore, ETH is a member of the ETHICSplus-group, i.e. of the following libraries sharing their inventories and being computerized and accessible via Internet [66]:

- **Main Libraries of the Swiss Federal Institute of Technology**
  - Zürich
  - Lausanne
- **Additional Libraries of ETH-Institutes**
  - Zürich: 13, incl. Chemistry, Pharmaceutical Science, Forestry, Intellectual Property, Conflict Research, Economy, etc.
  - Lausanne: 4, incl. Chemistry and Topometry
- **Other large Libraries (incl. cantonal university libraries)**
  - Zürich Central Library, the 2nd largest Swiss library with about 3.8 mio units (the National Library with about 3.2 mio is the 3rd ; it isn't accessible via ETHICS)
  - University of Bern: Science Library
  - University of Zürich: 4, incl. Institutes for Law and International Law
- **Libraries of Research Institutes of the ETH-domain**
  - EAWAG (Swiss Federal Institute for Environmental Science and Technology, Dübendorf)
  - EMPA (Swiss Federal Laboratory for Materials Testing and Research, St. Gallen)
  - PSI (Paul Scherrer Institute, Villigen)
  - Swiss Scientific Computing Center, Manno
- **Other Libraries**
  - 24, incl. the Federal Institute for Research on Fruits, Wine and Horticulture, Wädenswil, the Swiss National Museum, Zürich, and 10 technical colleges.

The information available from the main ETH-library itself is subdivided into 21 sections. They cover, i.a., environmental sciences and agriculture and food science.

On the one hand, the above is going far beyond the management of chemicals in the narrow sense. On the other hand, it is far from covering all the important Swiss libraries. E.g., there is no mention of governmental libraries like the one of the Federal Statistics Office nor of the libraries of the huge chemical companies also engaged in inter-library exchanges [67]. Nevertheless, the fragment presented should take care of the question regarding the availability of information. But there comes a next question:

Is the relevant information accessible to the people concerned?

Again, the answer is „yes", because all the mentioned ETHICSplus-libraries are accessible to the public and against a small fee mailing photocopies of any article which might be ordered. In addition, these libraries are, of course, not restricted to the volumes which are physically present in the country. They are engaged in significant international exchange.

Still, there is a next question – and it might actually be the crucial one in the light of the frightening amount of available and theoretically accessible information:

How are the people concerned getting the information they really need?

Of course, this is a difficult question. It can be partially answered by alluding to computer searches, to the fact that PC's are nowadys more common than typewriters in their best days, to the server-supported networks which are found in practically all the medium sized or even small companies and, of course, within the federal administration, etc. E.g., about 400 000 people are at least once a day logging in into Internet in Switzerland according to recent radio news [68], and the figure is still growing.

Thus, the question raised can be partially answered by indicating that there is in essence no restriction within companies and the federal administration and institutions in terms of access to internationally available databases (like STN), if it is required by the job in question. This works usually via Internet-Providers, and only the very large companies have direct access contracts.- But all this remains a partial answer to the question raised, and the really relevant points are still the education, experience, and international exposure of the people concerned and the composition, coherence, and critical size of the teams they form. This topic is addressed in the subsequent chapter. However, a last question shall be raised before turning the page on the subject of data access and use:

Are there missing elements?

And again, the answer is „yes" – in spite of everything said above! – There are two main points to be made to support that statement. The first regards Switzerland's

size and political situation. Thus, there is the well-known incomplete European integration of the country, which prevents its sharing of some databases available to its European neighbours and which forces it to process a comparatively very high per capita amount of information in attempting to manage chemicals at least as well as they do.... The second point is more technical. It regards especially the national databases which are at least in part still stored in a form which would have to be up-dated to provide all the possible user-friendliness and means of selective access permission to exploit their contents in a satisfactory way (concerns, e.g., the details in the file of toxic substances, i.e. the lists of poisons, which is actually the subject of a discussion on corresponding modernization). This last point of insufficient user-friendliness might to some extent hold in every country, but it remains a problem to be solved.

CHAPTER 10: TECHNICAL INFRASTRUCTURE

10.1 Laboratory Infrastructure

There is a proportionally very high number of chemical laboratories in Switzerland. About 20% of the employees in the chemical industry are working in research and development and spending about 40% of the total Swiss private R&D budgets [16, 20] (exact figures available for 1992 only). This includes a very significant analytical support and provides, i.a., the means for in-depth studies of questions related to chemical risks.

Thus, one of the large multinational chemical companies headquartered in Basel specifically investigated the current (1998) percentage of employees actually working in labs at their respective sites in the region. The resulting figure is 21% [69]. It includes all types of R&D- and other laboratories like those engaged in quality control and those supporting production, and it excludes the significant R&D-activities performed outside of laboratories, like supervision, clinical research, or data management. It also excludes production. With the fair assumption that this figure can be extrapolated to the whole of the Swiss chemical industry one arrives at about 14 000 people in laboratories for this industry alone.

Of course, there are many laboratories outside of the chemical industry. There are the other industries, the private R&D organizations, and the clinical or diagnostic laboratories, and there are the laboratories of universities, technical colleges, and public institutions. A comparatively very high percentage of the latter are engaged in the sound management of chemicals, though it has to be underlined that it is the manufacturing or distributing companies‘ duty to produce the required registration- and safety-data.

With regard to qualification and accreditation of regulatory laboratories the reader shall be referred to Annex I, Table 6, which addresses these issues. The Federal Office of Metrology is in charge of them and is aware of the respective developments. It pursues a strategy of harmonization and of adherence to the highest international standards [70].

Here, it has to be added that it is certainly difficult to exactly define the work to be considered when addressing the sound management of chemicals. UNITAR’s guidance document is speaking of „laboratory infrastructure for regulatory chemical analysis“. This would drastically reduce the type of facilities to be considered, but still leave room for interpretation: Are all the labs searching for pesticides in food or all the labs measuring VOC-emissions regulatory analytical labs? And what’s about the labs supporting, e.g., the Toxicology Institute belonging jointly to ETH and the Zürich University (cp. reference [74])? – These considerations led to the decision to just present the approximate figures compiled in table 10.A, which give an idea of the total size of the respective institutions, while attempting neither to precisely determine

the laboratory personnel, nor to exactly define the regulatory involvement in the management of chemicals.

Table 10.A: Relevant Public Institutions / Laboratories which are at least Partially Involved in the Sound Management of Chemicals

Type of Laboratories/Facilities/Organizations	**Approximate Headcount** (full time equivalents)	
	Total	**Remarks**
20 cantonal laboratories (some Cantons are sharing their labs: GL+ AR+ AI + SH and UR + SZ + OW + NW) [71]	> 500	Involvement in food and environment-related aspects ~ 50:50.
Intercantonal Office for Control of Medicines, Bern [6]	100	~ 30 working in the labs.
Swiss Agency for the Environment, Forests and Landscape [4]	~ 260	A minor percentage is working in laboratories. A recent count arrived at a total of ~ 60 involved in the management of chemicals.
Federal Office for Public Health (no consideration of Red Cross or Serum Institute) [4]	~ 300	
EMPA (Swiss Federal Laboratories for Materials Testing and Research) in Dübendorf and St. Gallen [72]	750	~150 – 200 in chemistry groups.
EAWAG (Swiss Federal Institute for Environmental Science and Technology) in Dübendorf [72]	200	Covers all aspects of water management (incl. supply, reservoirs, etc.)
Toxicology Institute in Schwerzenbach [73, 74] (joint activity of ETHZ, EPFL, and Zürich University)	80	Covers chemical and biological aspects. Main focus: research.
Suva (Swiss National Accident Insurance Fund) in Luzern [39]	~ 2000	~ 250 – 300 involved in occupational safety; thereof ~ 5% in chemical labs.
Swiss Federal Agricultural Research Institutes in Changins (Nyon), Liebefeld-Bern, Posieux, Tänikon, Wädenswil, and Zürich-Reckenholz / Liebefeld-Bern [75]	720	Involved in all aspects of agricultural research. A certain percentage of the work regards fertilization and pesticides.

The above compilation would provide an incomplete picture of the Swiss efforts regarding the sound management of chemicals without two additional remarks. The first regards the private laboratories and the out-sourcing of studies by governmental institutions and also by industry. Some of them, but not all, are members of the Association of Swiss Private Laboratories [76] and are partially sharing experience – e.g. with GLP-procedures.

The second remark concerns the federal and cantonal universities, though they are only to a marginal degree directly involved in regulatory matters. But they are internationally renowned and are making significant contributions to the identification

of problems to be analyzed and to solutions to be developed. Chemistry faculties with significant research activities are found with all the Swiss universities as mentioned below. The Swiss University in St. Gallen specialized in economy makes the only exception, though there is teaching even there. Thus, chemical research is done by

- ETH Zürich
- University of Zürich (ZH)
- ETH Lausanne
- University of Lausanne (VD)
- University of Bern (BE)
- University of Fribourg (FR)
- University of Basel (BS)
- University of Neuchâtel (NE)
- University of Genève (GE)

Altogether these Swiss universities (incl. St. Gallen) provide jobs for 29 000 people (with administrative and technical support personnel, but without the students, of course). Somewhat more than 10 000 thereof are ETH-positions [1].

The mentioned ETH-positions include the so-called annex institutes, i.e. the mentioned ones (EMPA and EAWAG) as well as the Paul Scherrer Institute (PSI) in Villigen (dealing with nuclear physics and chemistry) and the Institute for Forests, Snow and Land-scape Research (WSL) in Birmensdorf and Davos.

The largest chemistry faculties are the ones of ETH in Zürich (more than 400 employees including the ones directly financed by industry or the National Research Foundation) and of the Zürich University [72].

Finally the ETH's have a number of relevant faculties not found in the other universities. They deal with
- Agriculture, Food and Forestry,
- Process Technology, and
- Construction and Environmental Engineering.

10.2 Government Information Systems and Computer Capabilities

This section shall be kept very short and be in essence restricted to mentioning that there is no general government information system providing access to all the relevant data from financial to technical figures. But there are extended PC-networks within the federal administration, and there are numerous hosts and an enormous number of software applications. In addition, there is access to a pletora of commercial and other public data files, and there is the Federal Office for Computer Services within the Department of Finance (DF) [4].

The Federal Office for Computer Services is currently holding 210 positions, having a yearly operational budget of about 25 mio SFr., and spending about 240 mio SFr. per year on hardware and software on behalf of the whole of the federal administration.
In addition, further 120 mio SFr. of government expenditure regard software and hardware services to third parties [4].

One of the recent priorities of the Federal Office for Computer Services has been regarding the so-called year 2000 problem.

10.3 Education and Professional Training

The educational levels of the Swiss (age 25 – 64) are distributed as follows (cp. chapter 1) [1].

- 10% university
- 12% extra-university level three careers (higher professional training)
- 58% secondary level school plus 3 – 4 years professional education
- 20% obligatory school without further professional education.

This is laying the grounds for the „éducation permanente“ which has become a must for modern societies. The exemplary professional training is controlled by the respective professional associations and coordinated by the Federal Office for Professional Training and Technology, which supports the basic attitude of fostering a generalistic view at every level. Professional training is taking place everywhere and financed by governmental as well as many private funds. Thus, it would again be far beyond the scope of this National Profile to deliver the details, and it shall only be underlined that Switzerland has in recent years been making an effort to increase the „permeability“ of the educational system. Examples are the additional schooling and exams offered to talented apprentices (2nd type of career leading to higher education) or the activities in the field of post-graduate courses for people with technical college degrees.

10.4 Comments

The picture regarding technical infrastructure wouldn’t be complete without the following remarks:

- It goes without saying that the high number of scientists and employees in labs are sufficiently supported by state-of-the-art instrumentation. This regards the chemical industry in particular, but it also regards universities and governmental organizations.
- There is high efficiency regarding the exploitation of the available instrumentation thanks to important out-sourcing of analytical investigations by smaller companies or governmental labs and thanks to close and comparatively unbureaucratic collaboration of industry and universities.

- There is a satisfactory exploitation of the critical masses of scientists as encountered in the regions of Zürich (with ETH and its annex institutes as well as the university), of Basel (with the bulk of the chemical industry and the university with the Bio-Center and the remaining faculties), of Bern (with the federal administration and the university which is, i.a., bridging German speaking and French-speaking universities through important contacts with Fribourg and Neuchâtel), and of Lausanne-Geneva (with the two cantonal universities, the French-speaking ETH, and some industry). In addition, there are large university hospitals in all these regions fostering inter-disciplinary scientific thinking.
- Finally, there is an aspect of infrastructure, which is safety-oriented rather than technical. But it has to be mentioned somewhere. It regards the high level of protection of the environment on the one hand (no chemical facility which wouldn't be connected to an efficient waste water purification station) and of human beings on the other (incl. availability of shelters with air filters for close to 100% of the population in urban regions).

CHAPTER 11: INTERNATIONAL LINKAGES

11.1 International Bodies, Organizations and Agreements

Switzerland is neither a member of the United Nations, UN, nor of the European Union , EU. It is, however, participating in many of the UN's organizations promoting peace and development, and it is heavily involved in bilateral negotiations with EU [12, 15, 19, 77]. After all, it is surrounded exclusively by EU-states which are together representing its number one partner in international trade [1].

Table 11.A: Important Memberships in International Organizations

International Body/ Organization/Activity	Main Federal Responsibility		Remarks
	Department	Office (Agency)	
Intergovernmental Forum on Chemical Safety (IFCS)	DETEC	A. for the Environment, Forestry and the Landscape	DFA also involved. Intense collaboration with F.O. for Public Health.
United Nations Environment Program (UNEP)	DETEC	A. for the Environment, Forestry and the Landscape	DFA also involved.
International Register of Potentially Toxic Chemicals (IRPTC ⇒ UNEP)	DHA	F.O. for Public Health	
Industry and Environment Program Activity Center (IE/PAC ⇒ UNEP)	DEA	F.O. for Industry, Commerce and Labour	DETEC also involved.
International Program on Chemical Safety (IPCS)	DEA	F.O. for Industry, Commerce and Labour	DFA, FOPH and F.O. for External Economic Affairs also involved.
World Health Organization (WHO)	DHA	F.O. for Public Health	DFA also involved.
Food and Agriculture Organization of the United Nations (FAO)	DEA	F.O. for Agriculture	DFA and DHA with F.O. for Public Health also involved
United Nations Industrial Development Organization (UNIDO)	DFA	Directorate for Development and Cooperation	DEA also involved.
International Labor Office (ILO)	DEA	F.O. for Industry, Commerce and Labour	DFA also involved.
World Bank	DEA	F.O. for External Economic Affairs	DFA and DF also involved.
Organization for Economic Co-operation and Development (OECD)	DEA	F.O. for External Economic Affairs	DFA as well as, e.g., FOPH also involved.

Table 11.B: Important Participation in International Agreements/Procedures Related to Chemicals Management

International Agreements	Main Responsible Federal (Swiss) Office (Agency)	Remarks on Implementation etc.
Agenda 21 – Commission for Sustainable Development	S.A. for the Environment, Forests and Landscape (SAEFL)	See Introduction to this National Profile.
UNEP London Guidelines (voluntary procedure)	SAEFL	Put into effect in 1992.
FAO Code of Conduct (voluntary procedure)		Signed by SSCI.
Montreal Protocol	SAEFL	Put into effect in 1989.
ILO Convention 170	F.O. for Industry, Commerce and Labour	Dating back to 1946.
Aarhus Convention	SAEFL	Ratification expected in 2000. Refers to the public „right to know“ about environmental matters and to the respective implementation of legal requirements.
UN Recommendation for the Transport of Dangerous Goods	F.O. for Transport & Swiss Federal Railways	Publication of provisions planned for 1999. Ord. on transport of goods on the Rhein (SR 747.224.141) exists.
Basel Convention	SAEFL	Put into effect in 1992.
London Convention	SAEFL	Put into effect in 1992.
GATT/WTO agreements (related to chemicals trade)	DEA	Agreement of April 1994 (WTO).
Chemical Weapons Convention (CWC)	F.O. for External Economic Affairs & customs adminis-tration	Put into effect in 1997.

11.2 Comments

The Swiss direct democracy is promoting a political culture of early recognition of problems which might result from new legislation or the signing of international contracts. This has the drawback of eventually slowing down developments and the advantage of in essence excluding the serious consideration of treaties which couldn't be implemented or ratified thereafter. In other words: There are certainly very few international treaties signed by Switzerland, which present major or insurmountable obstacles regarding implementation.

Of importance is furthermore the point that Art. 89[5] of the (old) Federal Constitution requires submission to popular vote of the nation's joining organizations for collective security (regards especially military means) or of supranational bodies. This

Art. 89[5] and its accompanying provisions were presenting a challenge in view of interpreting their meaning in detail, but the basic principle is clear and more explicitely addressed in the new constitution (cp. Art. 140/1b on the mandatory referendum regarding the cases mentioned in the old Art. 89[5], Art. 141/1d on the optional referendum in case of treaties regarding, e.g., international law, and Art. 184/2 regarding the parliament's authority in other cases of international agreements). In a simplifying and summarizing way one may say that general and important contracts have to or may be submitted to the referendum, while isolated issues are handled by the government and the parliament or by the administration in accordance with the respective internal attribution of authority. This is not a complete change as already the old constitution is saying in Art. 102 (point 8): „The Federal Council shall pursue the external interests of the Confederation, particularly its international relations, and altogether be in charge of external affairs".

Now, the discussion shall be taken beyond the point of authority to implement agreements and address the practical side. This is in the first place concerning the work of the customs administration and the cantonal authorities and concerning the technical assistance to be provided, e.g., by SAEFL on the one hand and FOPH on the other. It is in addition concerning the ordinances decided upon in view of implementing international treaties; and the important ones are mentioned in Annex I. Finally, the organizational implementation is addressed in chapter 6 – at least in as far as it concerns internal procedures.

The federal administration gets assistance in terms of international agreements from industry and especially from the industrial organizations represented in international associations or, for the case of EU, having their offices in Brussels (cp. chapter 7). Therefore, the Swiss international industrial exposure is not only the purpose of, but to some extent also providing the means to fostering and developing international collaboration.

CHAPTER 12: AWARENESS AND UNDERSTANDING OF WORKERS AND THE PUBLIC

12.1 Permits to Handle Toxic Substances

There is broad awareness of the fact that the handling of **toxic substances** („poisons“) requires special permits and special attention. It is predominantly due to the fact that drugstores may not sell the respective products to consumers, unless the latter provide the corresponding permit, i.e. a signed form which they may get from the community's administrative service. In addition, there is general awareness, of course, of the **medical aspect**, i.e. of the professional degrees allowing for the selling, the prescription, or the administration of drugs.

In the professional environment there is furthermore awareness of the permits which companies have to hold, if they are handling toxic products. The F.L. on Toxic Substances requires that the concerned companies assign the corresponding responsibility to a person in charge – and this assignement depends on the person's education or on one of the following examinations (B – E) which he (or she) might have passed:

- **Permit A** is granted without further formalities and exclusively to persons who have successfully completed chemistry or related studies at the university or technical college level. It is general, and it cannot be obtained in other ways.
- **Permits B** and **C**, however, may either be obtained in the course of a successfully completed professional education (e.g. permit B for those responsible of drugstores and permit C for chemical laboratory technicians), or they may be obtained through courses and specific examinations. They are less general than the permit A.
- **Permits D** and **E**, finally, are again less general. They basically exclude the poison class 1, or they are restricted to specifically named applications, respectively [78].

Finally, the reader shall be referred to Annex I, table 6, with regard to the examinations that have to be passed by those applying chemicals in basically non-chemical fields like agriculture (regards, e.g., pesticides or wood protectants).

12.2 Discussion

The title of this chapter as proposed by UNITAR differentiates two categories of people: „Workers“, which shall be interpreted in the following discussion as „all those professionally involved“, and „The Public“, to be interpreted as „all the others“.

The **workers** have already been addressed in subchapters 10.3 and 10.4 in the context of permanent education taking place at all the professional levels. Thus, there is certainly a high, professional, differentiated, and continuously up-dated risk-awareness of all the employees within the chemical industry and the related governmental and other institutions. The risk-awareness within the chemical industry is focused on three domains:

- product quality,
- safety and occupational health, and
- environment.

The first domain addresses the chemical industry's responsibility, liability, and professional pride and has a long tradition. It has in the past decade been further promoted in view of the world-wide emphasis on consumer protection and guarantees, which resulted in the fostering of GLP- and GMP-procedures [79] (good laboratory/manufacturing practice) and in a rapidly increasing number of ISO-9000 (etc.) certified companies. In addition, there has been significant recent progress in bridging the formalistic requirements of modern quality control and the performance-, improvement-, and innovation-oriented thinking of the technically sophisticated staff encountered in the R&D labs and the production halls of the Swiss pharmaceutical industry. Large investments in the training of staff contributed to this development and to Switzerland's defending its role as important supplier of active pharmaceutical ingredients.

The professionals' risk awareness is certainly high as well with regard to the remaining domains, safety and occupational health and the environment, and there is also a growing number of ISO-14000 certifications. But this holds especially for the chemical industry, while there is still room for improvement in other domains like the transportation business. Thus, the chemistry training of drivers, e.g., is not yet everywhere at the desirable level [19].

Finally, the professionals' view might slightly differ from that of part of the media having a tendency to highlight environmentally relevant chemical events, while taking more of a low key approach in reporting on occupational accidents. The reason is obvious: the professional community is very much touched by an accident killing one of their colleagues, while the same event is almost negligible for the press in view of the fact that work accidents in the chemical industry are extremely rare and hitting no more than an absolutely irrelevant number of people in comparison to those killed every year in traffic accidents. Environment-related events, however, are almost always involving some kind of chemical.

The **general public** is giving weights to the above-mentioned three domains, which differ from those attributed to them by the workers.... and this discussion shouldn't be started without the remark that there is no single public opinion, of course. But the Swiss are known as a statistically very much environment conscious population. This becomes clear from the high number of „green arguments" in TV-ads and from the success of „green products" in the area of consumer goods and food. E.g., the Swiss

detergent market was amongst the first to favorably respond to the more concentrated liquid detergents requiring less packaging material and amongst the first to positively react to refill concepts, e.g. regarding shampoos. In addition, the Swiss are world champions in terms of separating household garbage [15, 80].

The second aspect of the general public's risk awareness regards product quality, and one might almost say that there is some kind of aversion against chemicals in this field. Thereby, the arguments are frequently not coming from the classical live sciences disciplines, and differing points of view may result in distinct disagreements. This is understandable in view of the complexity of the respective questions and of a legal and political language which often takes scientific terms to their limits.

Fortunately, the voting Swiss citizien has in general a rather fine responsiveness in terms of sensing the emotional sincerity behind the arguments put forward in public discussions. In addition, he (she) gets sensitive when the freedom to act is at stake, and he (she) votes down legislation which is too restrictive. The failure of the recent genome protection initiative may be an illustration of this point.

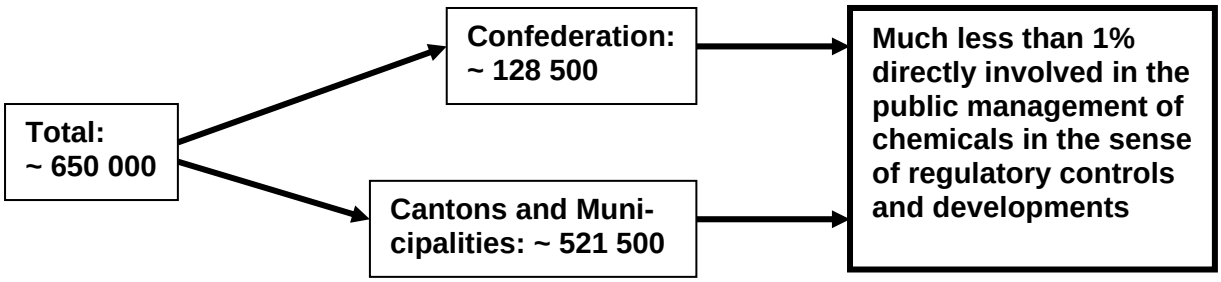
CHAPTER 13: RESOURCES AVAILABLE AND NEEDED FOR CHEMICALS MANAGEMENT

The discussion of the availability of and the need for resources might easily turn into an internal political fight, which would not be adequate in a document meant to become a point of reference for international comparisons. Nevertheless, a short comment shall address some of the conflicts arising from the attempt to manage chemicals as well as possible, while still avoiding counterproductive centralization of decision taking.

In the Cantons one is facing an increasing density of chemistry-related ordinances and regulations which have to be implemented, and about 40% of the more than 120 federal ordinances and laws etc. as mentioned in the tables of Annex I were actually issued in the 1990‘s. This is creating problems – especially in view of the current strong attempts to strictly control public spending. Thus, there is an increasing and non-ideal burden on the shoulders of staff often not allowed to add head-count.

The situation is not much different for the Confederation which makes strong efforts too to limit public spending. This is in part achieved by privatization. E.g., the system of the federal telecommunication monopoly has recently been abandoned, and a new financial basis for the Swiss Federal Railways is being discussed. Consequently, today’s figure is lower than the one shown below for 1995. But the demand for the respective services has not disappeared, of course.

Employees in Public Services (1995) [1]:



An exact figure for the public services‘ and the governments‘ involvement in the sound management of chemicals cannot be given as the respective workload of employees of the Customs Administration (total headcount ~ 4450), the Swiss Federal Railways (total headcount ~ 31 600), or the ETH-sector (total headcount ~ 10 100) [4] is not known. However, the involvement in chemicals-related regulations and controls of the concerned federal offices (Swiss Agency for the Environment, Forests and Landscape and Federal Office for Public Health) has recently been the subject of an estimate and of a comparison with other countries of the European Union, EU [21, 61]. This estimate was obtained in the context of discussing the

headcount-additions which might be required to more closely aline Swiss and EU-procedures and to implement the new Federal Law on Chemicals [46].

The estimated figure, i.e. the two federal offices' headcount actually concerned with the duties as covered by the discussed new law on chemicals, amounted to about **60**. It will be addressed again below.

To be added to the mentioned **60** positions are at the federal level about **40** belonging to the agricultural research institutes and about **100** belonging to the Intercantonal Office for the Control of Medicines (IKS) [6, 84], though the latter are, of course, not „federal" in the strict sense of the word. Finally, the sum of all the employees in cantonal laboratories (incl. management and administration) is higher than **500** [71].

A look at the public spending for environment- and public health-related matters is worthwile in this context, though the exact sum spent on controlling the sound management of chemicals is again unknown. But it cannot be more than a fraction of a percent of the following figures (table 13.A).

Table 13.A: Public Spending on Health and Environmental Matters [1]

Purpose	**Amounts in mio SFr. and Level Spending them**			
	MUNICIPAL	CANTONAL	FEDERAL	ALL 3 LEVELS
HEALTH	**6 903**	**8 784**	**184** (excl. health insurance)	**14 224** (thereof 13102 on hospitals)
ENVIRONMENT	**3 288**	**1 441**	**582** (thereof 332 on true environmental protection)	**4 482**

Obviously, the total (all three levels) is falling short when compared with the respective sum of the amounts in columns 2 – 4 of the table above. The reason is that there are more than 1.5 bio Sfr. in subsidies regarding health matters and more than 800 mio SFr. regarding environment-related projects. This is mainly money which is spent „top down" in support of priority programs. To be added is the point that „environment" includes protection of the landscape and organized use of land, i.e. things like the correction of mountain torrents, the construction of noise protection walls, where highways run close to residential areas, or the financing of indemnifications of owners of land, which may result from new and stricter zoning directions.

Overall, there is certainly no abundance of personnel or financial means for the public management of chemicals, while new challenges are being faced: E.g, there is the recently issued Ordinance on VOC-Incentive Taxes [81], the Ordinance on Environmentally Hazardous Substances [82], the Ordinance on Air Pollution Control [83], or the need for tighter control of chemical street transports, and all require coordination between the Confederation and the Cantons. Here, there are inherent conflicts with regard to detailed assignments of responsibility (centralization versus decentralization) and, e.g., with regard to the resulting needs for additional staff.

This chapter shall be ended by presenting an **international comparison**. It is based on the already cited discussions [21, 61], and it addresses the mentioned nations' staff involved in the public control of the sound management of chemicals and especially in controlling notifications and registrations. However, some comments have to be made before presenting figures (table 13.B):

a) There is a distinct defensiveness which one always encounters when attempting to investigate head-counts and output of given functional units, be it in an industrial or a governmental environment. Therefore, it is difficult to get reliable figures because of „political sensitivity" of the information in question.

b) There is the difficulty that „comparable technical positions" may not be compared without comparing the exact technical „cahiers de charge". This takes in-depth technical understanding in addition to strong top level support of the endeavour.

c) The organization of ministries and responsible offices differs from country to country, which impedes comparability.

Thus, the figures in the following Table 13.B have to be interpreted with care and in consideration of the fact, that they are **not including the Swiss efforts as provided by the Federal Office of Agriculture** or the respective Research Institutes (some 40 additional positions) [84].

Table 13.B: Staff Involved in Judging Submissions/Dossiers – International Comparison [21, 61] (the figures include some out-sourcing)

Countries	**Handling Dossiers re. Chemicals (New and Old Products)**	**Handling Dossiers re. Pesticides and Biocides**	**Total**	**Total Population (Mio)**
Switzerland	**~ 5** **0.7 ppm**	~ **6** **0.9 ppm**	**~11** **1.6 ppm**	**~ 7**
AU + FR + GE + NL + SF + UK	~ **250** **1.1 ppm**	**> 135** **(1.2 ppm)**	**> 385** **(2.3 ppm)**	**~227**

Remarks: The **ppm figures** are expressing the staff involved in the judgement of dossiers as a part of the concerned total population, whereby **ppm figures in brackets** are indicating that there was incomplete information available for the comparison (no or incomplete information on FR and UK). In this latter case the ppm figures are, therefore, referring exclusively to the population of the remaining countries.
Abbreviations used are AU = Austria, FR = France, GE = Germany, NL = Netherlands, SF = Finland, UK = United Kingdom.

Of course, the above figures regarding the „judging of dossiers“ leave room for interpretation, though this is in essence a typical national control function everywhere. But there has to be quite a bit of supplementary activity. Especially the Swiss figure regarding the control of pesticides is at least five times higher than the one in table 13.B according to the cited recent estimate of the Federal Office of Agriculture [84], if one is more broadly interpreting the activity in question.

Nevertheless, the figures in table 13B point to a lean structure handling the dossiers in Switzerland. The figures are even impressive, when considering the fact that the number of dossiers to be checked is in essence independent of the size of the population in question. But they may also point to a less in-depth control, i.e. a consequence of Switzerland's having introduced its Federal Law on Poisons very early. Therefore, one has probably to expect a change upon implementation of the new legislation under preparation [46].

The final comparative aspect to be discussed regards the cited 11 Swiss positions involved in the control of dossiers and the about 60 mentioned earlier, i.e. the estimated total number of employees who are currently in the Federal Office for Public Health and the Swiss Agency for the Environment, Forests and Landscape handling regulatory aspects of chemicals as covered by the discussed new law [46] (the 60 include external collaborators and exclude, e.g., the field of drugs):

The respective Swiss ratio, 60 / 11 at the national level, is higher than the one obtained when adding up the figures which were available for the other countries mentioned. Their ratio is about 1100 / 385. In addition, about 500 of the 1100 are actually regarding France alone, where one finds, e.g., a public service of more than 200 centrally employed intoxification specialists, while no respective figure has been available to the author or been counted for Germany (and the same service is, by the way, also in Switzerland offered by a foundation, i.e. the Toxicology Information Center in Zürich, which is supported by several Cantons as well as the SSCI). Therefore, this type of comparison is really taking statistics to their limits because of organizational differences of the countries compared. Still, one might tentatively conclude that Switzerland is comparatively weak in terms of controlling dossiers, but stronger in terms of controlling other chemicals-related matters. This is especially significant in the light of the fact that Switzerland is not participating in some of the sharing of efforts, which takes place amongst EU-countries.

CHAPTER 14: OUTLOOK

This outlook shall be opened by reminding the reader of some facts:

- Switzerland has a strong chemical industry exporting a very large percentage of its production.
- Switzerland is a developed country importing all of the fossile fuels it consumes.
- Switzerland has a narrow network of communications.
- Switzerland consists of 26 Cantons of strongly differing size (Zürich ~ 1.2 mio inhabitants, Appenzell I.Rh. ~ 14 000). Many are covering parts of more than one of the country's geographic regions.
- Switzerland is a democratic Confederation of Cantons which are very important in terms of implementing chemicals-related legislation.
- Switzerland is fostering private entrepreneurship and the role of professional and industrial associations.
- Switzerland is located in the heart of Europe. It is a member of OECD and has signed many of the international agreements regarding chemicals. But Switzerland is not a member of EU, the European Union. It is, however, heavily involved in bilateral negotiations with the latter which also is its number one partner in international trade.
- Switzerland has a strongly environment-conscious population and an advanced legislation regarding environmental protection, but the basis of its health-oriented legislation on chemicals dates back many years, and an update is currently under discussion.

The facts cited above are directly leading to possible future developments and to conflicting trends to be considered on the way. But there are a number of agreed-upon goals and broadly recognized restrictions:

- Decision taking should take place at the level of maximum expertise, while still respecting the mechanisms of democracy and justice. This must be considered in the future allocation of responsibilities to the Confederation and the Cantons or to public and private bodies, respectively. It is vital in the discussion on the reallocation and reorganization of drug control.
- The common interest has to be fostered without unnecessarily stressing the interests of individual Cantons or groups. This requires differentiated approaches in dealing, e.g., with regulations concerning fertilization, with rules regarding chemical wastes, or with measures facilitating importation and exportation. It will as well have to be considered in implementing the newly introduced VOC-incentive tax or in discussing the idea of corresponding legislation regarding CO_2.
- There is a need to modernize legislation on chemicals and especially its health-related aspects. It must be pursued under circumstances which aren't really clear in terms of Switzerland's future relationship with EU. But it is

obvious that the new legislation will have to refer to the actual or envisaged market volume as one of the characteristics of products to be judged, and it is also clear that international harmonization must be a key priority.

There would be additional agreed-upon goals and restrictions, but this outlook shall now take a turn and approach the future from a different starting point. The importance of the definition of „chemicals“ has already been underlined in this National Profile (chapter 5, page 53). It is also stressed in the comments accompanying the draft of the new law on chemicals [Chemikaliengesetz (ChemG) Vorentwurf (Swiss Federal Department of Home Affairs, 1995)]. There, one reads:

„Art. 2^1 This Law applies to dealing with substances and preparations.

Art. 2^2 It is not applicable to:

a) the transit of substances and preparations in as far as they are not manipulated or processed;
b) transportation of substances and preparations, which is subject to the respective federal legislation on mail, on railways, on street- or air-traffic, on transportation on water, or on pipelines.

Art. 2^3 The Federal Council may amend the realm of applicability of this Law or of some of its regulations to:

a) organisms which have or may have dangerous properties in the sense of this Law;
b) objects containing substances or preparations which may endanger life or health;
c) the protection of life and health of domestic and wild animals.“

This would be a significant step forward from the definition found in the actual law to be replaced, i.e. the Federal Law on Poisons, which reads:

„Art. 1^1 Dealing with poisons is subject to the regulations of this Law.

.....

Art. 2 Regarded as poisons are non-living substances and preparations obtained therefrom, which, upon absorption by the body or upon touching it, may endanger life or health of humans and animals on the grounds of chemical or physicochemical action in comparatively small amounts already and which, therefore, have to be handled with special care.“

In addition, the new law would to a good extent address chemicals in terms of their life cycle as defined in UNITAR’s guiding document, i.e. from isolation, importation, or preparation via use, storage, or transportation through exportation or disposal – and only the last and third from last point would still be just marginally touched, because they are addressed by the Federal Law on Environmental Protection and by the laws on transportation, respectively. The new law would even to some extent consider the specific aspects of, e.g., owning or selling chemicals, i.e. transformable goods as mentioned in chapter 5, and it would maintain and strengthen self-control and due diligence requirements.

Here, it shall be added that the special nature of chemicals has finally been reason enough for a mention in the new, totally revised Constitution (Art. 104/3d and Art. 118/2a) as accepted in the public vote of April 1999. But this outlook shall now be concluded by more practical thoughts.

Chemicals pose factual problems which are approached differently by different countries. Nevertheless, the problems are normally solved – though with more or less effectiveness and efficiency. But the comparability of the approaches remains problematic. The second half of chapter 13 is underlining this point. In addition, the experience in compiling the data for the present National Profile has led to the conclusion that the relevant information is sometimes just not available with sufficient precision – or at least not easily accessible in spite of computer files and networks. This is a drawback, of course, when attempting to learn and to develop procedures on the basis of studying other countries‘ solutions, when trying to pool experts‘ opinions, or when hoping to find scientific common denominators. All the more it is illustrating the value of preparing national profiles and of keeping them up-dated in order to one day be able to reliably measure and compare progress, to improve coordination, and to optimize organizational structures.

The final thought shall address attitudes concerning the general public’s reservations with regard to experts‘ judgements and concerning the experts themselves and all the organizational bodies citing them. Thus, there may be improvements and less futile spending, if the general public builds strengthened confidence into experts‘ opinions and if experts and organizational bodies refrain more strictly from confronting the general public with information which is misleading, because it is not sufficiently put in perspective. This takes us to the hope, finally, that the present National Profile fosters communication and mutual understanding.

REFERENCES AND NOTES

1 Statistisches Jahrbuch der Schweiz 1998 (Ed. Swiss Federal Statistics Office, Verlag Neue Zürcher Zeitung, 1997).

2 The Swiss Report (Ed. Swiss Agency for the Environment, Forests and Landscape – compiled for the United Nations Conference on Environment and Development, Rio de Janeiro, June 1992).

3 Federal Constitution of the Swiss Confederation – unofficial translation, updated March 1997 (Ed. Federal Department of Foreign Affairs – available from EDMZ, CH-3000 Bern). This translation regards the old rather than the totally revised constitution in force since Jan. 1st, 2000.

4 The Swiss Confederation, a brief guide (Ed. 1998, a publication of the Swiss Federal Chancellery, available from EDMZ, CH-3000 Bern).

5 Discussion with Dr. Jürg Seiler, Intercantonal Office for the Control of Medicines (IKS).

6 Brochure IKS (Ed. Intercantonal Office for the Control of Medicines, Erlachstr. 8, CH-3000 Bern 9).

7 The conclusion „below average GDP-contribution of agriculture“ includes forestry. It is based on employment figures (%) and the total agricultural GDP-contribution as found in 1 (p. 248). Also considered is an extrapolation of the so-called 1994 production account (8) according to index figures (9 to 11). Trade balance figures are addressed in 1 (p. 218).

8 Production Account 1994 (Swiss Federal Statistics Office). Figures were extrapolated according to production indices.

9 Cp. production index in 1.

10 Der Geschäftsgang in der Schweizer Industrie (Ed. Swiss Federal Statistics Office) – Die Produktions-, Auftrags-, Umsatz- und Lagerindizes 1995.

11 Der Geschäftsgang im sekundären Sektor – Produktion, Handel und Verbrauch – Die Produktions-, Auftrags-, Umsatz und Lagerindizes – 1. bis 3. Quartal 1997 (Ed. Swiss Federal Statistics Office).

12 Switzerland 1998/99 (figure on page 30 copied with friendly permission and support of the Editor: Kümmerly + Frey, Geographical Publishers, Zollikofen-Bern, 1998).

13 Estimated GDP-contribution by Canton based equally on percentage of total agricultural employees and percentage of agricultural surface, whereby alpine pastures were given half the weight.

14 Employment figures by Cantons, 1985, 1991, 1995 (NOGA, Sector 2; 2-digits, incl. numbers of facilities – Swiss Federal Statistics Office).

15 The Environment in Switzerland 1997 (Ed. Swiss Federal Statistics Office and Swiss Agency for the Environment, Forests and Landscape, available from EDMZ, CH-3000 Bern).

16 Schweizerische Chemische Industrie, Zahlen und Fakten 1997 (Ed. SSCI, Swiss Society of Chemical Industries, Nordstr. 15, Postfach 632, CH-8035 Zürich).

17 Directorate of the Swiss Customs – Swiss-impex (Exports and Imports according to Types of Goods, Jan. – Dec. 1996).

18 The Chemical Industry in 1996, Annual Review (Ed. United Nations, Economic Commission for Europe, New York and Geneva 1997).
19 SSCI, Swiss Society of Chemical Industries, Annual Report 1997.
20 The Swiss Chemical Industry (Ed. SSCI, 1989).
21 Discussion with H. Reust, Swiss Federal Office for Public Health.
22 Compilation provided by SSCI: Calculations by the Secretary of the Swiss Association of Farmers, Formation and Use of Fertilizers (1981 – 1996).
23 SSCI-inquiry: Sales of Pesticides (1990 – 1995).
24 Pflanzenbehandlungsmittel: Markt-Statistik Schweiz und Fürstentum Liechtenstein 1988 – 1996 (Ed. SSCI, 1997).
25 Gardening use of fertilizers: Discussion with R. Hauert, 3257 Grossaffoltern.
26 Brochure on Crude Oil, Swiss Imports, Sales and Use 1996 (Ed. Erdöl-Vereinigung ,EV, Löwenstr. 1, 8001 Zürich, CARBURA).
27 Industrial chemicals: Estimate based on assumption that imported solvents/ingredients are mostly used (minor re-exportation).
28 Pharmaceuticals: Use estimate based on total costs of health care and percentage of medication as cited in 1.
29 Annual Report of the Swiss Soap and Detergents Industry 1996 (Ed. Verband der Schweizerischen Seifen- und Waschmittelindustrie, Breitingerstr. 35, CH-8027 Zürich).
30 Minimum estimated use of „others“ as mentioned in Table 2.B based on comparison with soaps and detergents.
31 Sonderabfälle in der Schweiz 1994 und 1995 (Ed. Swiss Agency for the Environment, Forests and Landscape, 1997). The figures presented in Table 2.C are sums of figures published for individual code-numbers. Thus „batteries“ (24 612 tons) is, e.g., combining code-numbers 3220 – 3225, i.e. 4304 + 20188 + 115 + 5 + 0 + 0 tons.
32 Schriftenreihe Umwelt Nr. 251, Umweltgefährdende Stoffe (Ed. Swiss Agency for the Environment, Forests and Landscape, 1996).
33 OECD Report „Environmental Performance Reviews, Switzerland“ (Ed. Group on Environmental Performance, Environment Policy Committee, OECD, 1998). This report confirms to a large extent the condensed views as compiled in table 3.A. - Obviously, there is a wealth of additional literature on the subject of environmental and chemicals-related problems, and the references given for chapter 3 are no more than a rather arbitrary selection.
34 a) Kaspar Villiger, Federal Councillor, Address to the 1997 General Assembly of SSCI, Swiss Society of Chemical Industries (available from SSCI, Nordstr. 15 Postfach 632, CH-8035 Zürich). b) Daniel C. Wagnière, Presidential Address given at the same occasion and published in the same brochure as a).
35 The Chapter „Umwelt“ (p. 113 – 132 in 1) assesses the environment’s different dimensions.
36 Zur Lage der Umwelt in der Schweiz (Environmental Report 1993, Ed. Swiss Agency for the Environment, Forests and Landscape).
37 Discussions with Drs. P. Fontana and P. Vesel, SSCI.
38 Discussion with Dr. A. Koller and Mr. R, Fiechter, GR.
39 Discussion with Dr. S. Aschwanden, Suva.

40 Chemikaliengesetz (ChemG), Erläuternder Bericht zum Vorentwurf (Swiss Federal Department of Home Affairs, 1995).

41 Discussion with Dr. A. Klaus, Safety Inspectorate, BL.

42 There is no 1 : 1 correlation of articles in the old and the new constitution.

43 Die neue Bundesverfassung (distributed in the respective language to all Swiss households in early 1999).

44 The total revision of the constitution was initiated based on a parliamentary decision of June 3, 1987.

45 Vom Paragraphen zum Paradies – Schweizer Umweltrecht (edited 1990 by SAEFL; available from EDMZ, CH-3000 Bern).

46 Chemikaliengesetz (ChemG) Vorentwurf (Swiss Federal Department of Home Affairs, 1995).

47 The term „chemicals“ is actually mentioned in the revised Federal Constitution (Art. 118) as accepted in the public vote of April 1999.

48 Restrict List, Status Oct. 1997 (Ed. SGCI, Nordstr. 15, CH-8035 Zürich).

49 Federal Ordinance on the Mission of Departments, Groups, and Offices (status 1.1.97 with up-date of Dec. 19, 1997; SR 172.010.15).

50 Discussion with Dr. B. Müller, Siegfried AG, Zofingen.

51 Umwelt-Materialien Nr. 109, Nationales Schadstoff-Emissionsregister, Situationsbericht (Ed. Swiss Agency for the Environment, Forests and Landscape, 1999).

52 Relevant laws and ordinances are compiled in Tables 2 – 7 of Annex I.
The hierarchy regarding implementation or responsibility is in many cases addressed even in the Constitution. E.g., Art. 33 of the old constitution read „[1] The Cantons may require certificates of professional capacity in order to allow execution of scientific professions.[2] Federal legislation shall provide the possibility to obtain such certificates valid throughout the Confederation.“ (translated from German). A similar principle is addressed in the new constitution which, however, defines one Swiss economic space (Art. 95^2).
The federal laws (hierarchically the next level) are in many cases foreseeing details to be regulated by ordinances, and there is a hierarchy of ordinances as well. E.g., the Ordinance on Environmental Impact Assessment is opened by the statement „Based on Art. 9, 39 paragraph 1, and 46 of the Law on Environmental Protection the Federal Council decrees...“. The Ordinance on the Classification of Liquids Hazardous to Water, however, is opened as follows: „Based on Art. 11 of the Ordinance of Sept. 28, 1981, on the Protection of Waters against Hazardous Liquids the Department of Home Affairs decrees...“. This, therefore, is an example of a so-called departmental ordinance.- Finally, implementation may be addressed at all levels of legislative hierarchy. E.g., the already mentioned Ordinance on Environmental Impact Assessment reads in Art. 12: „Competences: [1] The Canton's technical office for protection of the environment judges the reports on projects examined by cantonal authorities. The cantonal legislation defines the respective delay.“

53 EKAS – ein Porträt (Brochure available from EKAS, Sekretariat, Fluhmattstr.1, CH-6002 Luzern, ed. 1996). EKAS decides on priorities and financing of strategic prevention programs, while Suva's own board has its main focus on insuranc aspects.

54 Discussion with Dr. J. Tremp, Office for Protection of the Environment, BL.

55 OR Annex V, Art. 54.

56 Wegleitung 1997 für Mehrwertsteuerpflichtige („Instructions for those amenable to value added tax declaration“ - Ed. Swiss Federal Tax Administration, 1997).

57 The author’s years-long activity in the executive management of a large Swiss chemical group provides the basis of experience and facts addressed by some of the statements in chapter 7.

58 An extensive list of organizational bodies is found in Annex IV.

59 Discussion with W. Resch, Basel Area Business Development (Wallstr. 1, CH-4010 Basel.

60 The Canton BL has, in essence like all the others, a complete set of laws and ordinances regarding the environment as well as toxic substances. It also has its systematic register of legislation, which is organized in analogy to the one of the Confederation (SGS- instead of SR-numbers), and the Canton’s complete SGS-compilation is accessible via Internet: http://www.baselland.ch.
E.g., the Canton’s Law on Environmental Protection (USG BL, SGS 780) has 57 articles and takes some 12 printed pages. It is supplemented by a respective ordinance (USV, SGS 780.11), and it includes chapters on
- General Decrees (A)
- Protection Against Major Accidents (B)
- Protection Against immissions (C)
- Wastes (D)
- Soil (E)
- Implementation and Procedures (F)
- Punishment (G)
- Existing Legislation To Be Changed upon Enacting the Law (H).

I.a., the Canton’s Law on Environmental Protection addresses details regarding fire- and chemical accident brigades, the measuring and controlling of emissions, or traffic.
Further laws and ordinances of importance in the context of chemical manufacturing and trade are, e.g., the Law on Construction (SGS 400), the Law on Energy (SGS 490), the Law on the Protection of Waters (SGS 782), or the Ordinance regarding the Federal Law on Toxic Substances (SGS 955.1).

61 Discussion with Dr. G. Karlaganis, BUWAL (SAEFL).

62 Umweltschutz, BUWAL-Bulletin 3/96 (available from Swiss Agency for the Environment, Forests and Landscape, CH-3003 Bern).

63 Organizational chart received from Dr. A. Klaus (cp. 41).

64 Report on the first project phase of the Canton Basel Landschaft’s comprehensive risk analysis (authored by Elektrowatt AG, Zürich, TÜV Rheinland e.V., Köln, and the Canton’s Risk Analysis Group, 1998).

65 Brochure „ETH-Bibliothek“ (available from ETH Bibliothek, Rämistr. 101,CH-8092 Zürich).

66 Documentation ETHICSplus-Verbundbibliotheken (available from the above address).
ETHICSplus is accessible via the World Wide Web (Internet). This requires mainly a 32 bit operating system (e.g. Windows 95, Windows NT, Unix etc.), a Java-compatible 32 bit WWW Browser (e.g. Netscape Navigator as from 2.0x,

Microsoft Internet Explorer 3.0), and a high resolution screen with at least 256 colors. The address is „**http://www.ethics.ethz.ch/hotethics.html**". Questions may be addressed via E-mail to „**hotethics@library.ethz.ch**". Additionally, access is possible via TELNET, TELEPAC and other networks.

67 The Federal Statistics Office has the following Internet address: „**http://www.admin.ch/bfs**". Its mail address is Schwarztorstr. 96, CH-3003 Bern. Its library is public and holding all its publications edited since the foundation of the office in 1860. In addition, the library is holding large numbers of statistical publications on the Cantons and Swiss towns, but also on EU, EFTA, OECD, UN etc.

68 Radio DRS, News of Sept. 24, 1998.

69 Interview with Dr. H.R. Wyss, F. Hoffmann-La Roche AG, Basel.

70 Studie und Strategievorschlag: Metrologie der Stoffmenge und Referenzmaterialien in der Schweiz (EMPA-report, April 1999).

71 Interviews with and data from about 10 cantonal chemical Laboratories and extrapolation of the number of employees.

72 Interviews with the Personnel Departments of the respective ETH Annex Institutes.

73 Interview with the Personnel Department of ETH Zürich (Center).

74 The Toxicology Institute is currently being restructured and down-sized.

75 Inventory of Research Projects 1996 – 1999 (Ed. Federal Office of Agriculture, CH-3003 Bern).

76 Association founded in 1981; address: Elfenstr. 19, CH-3000 Bern 16.

77 Amtliche Sammlung des Bundesrechts und Systematische Sammlung des Bundesrechts – Systematisches Register 1997 (Ed. Federal Chancellery, 1998 available from EDMZ, CH-3000 Bern – also accessible via Internet: **„http://www.bk.admin.ch"**).

78 Cp. Table 6 in Annex I as well as Art. 31 – 35 of the Ord. on Toxic Substances (SR 813.01).

79 OECD-principles of GLP adopted in 1983 (GLP in Switzerland, Procedures and Principles; joint SAEFL-IKS guidelines of March 1986).

80 H.R. Bircher as well as Heinz-D. Graffmann in Proceedings of the 3rd World Conference on Detergents (AOCS Press, Champaign, Illinois, 1994).

81 SR 814.018. Cp. Table 4 of Annex I.

82 SR 814.013. Cp. Table 4 of Annex I.

83 SR 814.318.142.1. Cp. Table 4 of Annex I.

84 Communicated by Dr. E. Bosshard, FOA.

Annex I Table1: References to Existing Legal Instruments Addressing the Management of Chemicals – Directly and Indirectly Relevant Articles of the Amended Constitution from 1874 (new constitution mentioned in part), which has been the Basis of the Legislation as Presented in the Subsequent Tables 2 – 7 *)

Article	Especially Concerned Departments	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects or Objectives of the Article
Art. 2, New C.: 2, 73	All	Implicitely all	Purpose of the Confederation (CH): Welfare of citizens. New C.: Art.2 includes preservation of natural sources of life, while Art. 73 further substantiates sustainability and the equilibrium of nature's regeneration capacity and of its being exploited by man.
Art. 8 New C.: 54, 101	All	Implicitely all	CH alone has the right..... to conclude..... customs and commercial treaties with foreign States (Art. 9 mentions exceptions). New C.: Art. 54 defines CH's responsibility for external affairs. Aspects of trade are also mentioned in Art. 101.
Art. $22^{quater-1}$ New C.: 75.1	DHA, DEA, DETEC	Implicitely all	CH shall enact by legislation the principles applicable to the zoning plans to be drawn up by the Cantons for the purpose of..... judicious use of land.....
Art. 24^{bis-2} New C.: 76.3	DETEC	Implicitely all, especially pollutants	CH shall issue provisions on..... the protection of surface & underground waters against pollution.....
Art. $24^{quinquies-2}$ New C.: 90, 118	DHA, DDPS, DEA, DETEC	Radioactive products	CH shall enact regulations on protection against the dangers from ionising rays. New C.: Art. 90 reserves legislation on nuclear energy to CH.

*) The wording of the totally revised Federal Constitution as submitted to public vote has been accepted in April 1999. This new Federal Constitution is more transparently structured than the one of 1874, which was partially revised more than 140 times. Nevertheless, the revised Constitution preserves most of the values of its predecessor, and it is not adding too much real innovation. Still, the adaptation of some details in the actual laws and ordinances to the revised Constitution will take time. Therefore, it makes sense to present this Table 1 along with the subsequent Tables 2 – 7 and to include some references to the new constitution (abbreviated as „New C." throughout this annex I), where at least parts of the topic are addressed and where reference to the new constitution is especially appropriate or enlightening.

Annex I Table 1 (continued – articles of the amended Constitution from 1874 and in part of its successor)

Article	Especially Concerned Departments	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects or Objectives of the Article
Art. 24septies – 1,2 New C.: 74	DETEC	Pollutants, especially volatile products	CH shall legislate on the protection of the human person and its natural environment against harmful acts or nuisances. It shall, in particular, combat air pollution..... The excecution of federal prescriptions shall be incumbent on the Cantons, unless this duty is attributed by law to CH. New C.: Art. 74 mentions, i.a., the „polluter pays"-principle.
Art. 24novies – 2, 3 New C.: 119, 120	DHA, DEA, DETEC	DNA, RNA	CH shall enact provisions..... and shall be guided, in particular, by the following principles: ..... non-human reproductive and genetic material may be neither introduced into nor combined with human reproductive material..... no trade may be conducted in human reproductive material or in any product obtained from embryos. CH shall enact provisions governing the use of reproductive and genetic material derived from animals, plants & other organisms. New C.: Art. 119 i.a. forbids cloning or engineering of human germ cells and embryos; Art. 120 addresses non-human genomes.
Art. 25bis – 1, 2 New C.: 80	DHA, DEA	Products of animal origin	CH shall be empowered to legislate on the protection of animals. Federal legislation shall apply in particular to..... the import of..... products of animal origin.
Art. 26bis New C.: 91.2	DHA, DEA, DETEC	Liquid or gaseous fuels	Legislation on pipelines for the transport of liquid or gaseous fuels is a federal concern.
Art. 28 New C.: 133	DF	Implicitely all	All matters related to customs are a federal concern. CH is entitled to levy import and export duties.
Art. 29[1, 2] New C.: 101	DF	Implicitely all	The customs legislation shall..... facilitate..... trade..... CH may, in extraordinary circumstances, temporarily resort to exceptional measures.
Art. 31[1] New C.: 27	DEA	Implicitely all	Freedom of trade and industry is guaranteed..... subject to such limitations as are contained in the Federal Constitution.....

Annex I Table 1 (continued – articles of the amended Constitution from 1874 and in part of its successor)

Article	Especially Concerned Departments	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects or Objectives of the Article
Art. 31$^{sexies - 1}$ New C.: 97	DHA, DEA	Consumer products	While safeguarding the general interests of the Swiss economy..... CH shall take measures for the protection of consumers. New C.: Art. 97.2 puts consumer organizations at the same level as professional or industrial associations regarding laws on competition.
Art. 32$^{bis - 1, 7}$ New C.: 105	DF	Ethanol, narcotics, drugs	CH is entitled to legislate on the manufacture, import, refining, sale and taxation of distilled spirits. No taxes shall be levied on products which are exported, or in transit, or denatured..... The Cantons shall receive 10%....., which they shall spend on combating the causes and effects of alcoholism and the abuse of ..... drugs.
Art. 34 New C.: 110	DHA, DEA	Industrial chemicals (implicitely)	CH may..... issue regulations for the protection of workers in..... dangerous industries.
Art. 34$^{bis, ter}$ New C.: 110, 117	DHA, DEA	Implicitely all	CH shall institute..... an insurance against illness and accidents..... CH is entitled to legislate on..... the protection of employees.....
Art. 36$^{sexies - 1}$ New C.: 84	DETEC	Transported chemicals (implicitely)	CH shall protect the Alpine region from the negative effect of transit traffic.
Art. 41^{2} New C.: 107	DDPS, DEA	Explosives	The manufacture, purchase and distribution of..... explosives..... are subject to an authorisation.....
Art. 64^{1} New C.: 122	DJP, DEA	All (implicitely)	CH may legislate..... on all legal matters relating to commerce and movable property transactions.....
Art. 69 New C.: 118	DHA	Drugs (implicitely)	CH may enact legislation to combat contagious, widespread and particularly dangerous diseases of man and animals. New C. specifically mentions provisions regarding use of chemicals.
Art. 69$^{bis - 1}$ New C.: 118	DHA	Dangerous chemicals in food & consumer products	CH may legislate a) on trade in foodstuffs; b) on trade in other consumer goods insofar as they may endanger life or health.

Annex I Table 2: References to Existing Legal Instruments Addressing the Management of Chemicals – Focus on Food, Consumer Goods, Poisons, and Industrial Goods

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
F.L. on Food and Consumer Products 817.0	Esp. Art. 1 – 7, 9, 22, 24, 25 09.10.92	DHA; F.O. for Public Health	Esp. additives; incl. cosmetics, excl. pharmaceut. & industrial products	Protection of consumers' health; control of imports (esp. of food) by CH; principle of limiting concentrations; hygiene; delegation of control of food to Cantons.
Ord. on Food 817.02	01.03.95	DHA; F.O. for Public Health	Food additives	Regards handling and labelling of agricultural products, additives, GMO-products etc.; addresses types of food and associated components/chemicals; positive lists, e.g. of sweeteners and allowed types of salt (total ~140 pages).
Ord. on Food Additives 817.021.22	26.06.95	DHA; F.O. for Public Health	Food additives	Contains positive lists of colorants, anti-oxidants, preservatives, emulsifiers etc.
Ord. on Food Contaminants 817.021.23	26.06.95	DHA; F.O. for Public Health	Food components & contaminants,	Principle of toxicological acceptability; contains lists combining types of food and tolerated limits of pesticides, metals, toxins, veterinary drugs etc.
Ord. on Approval of GMO's in Relation to Food 817.021.35	19.11.96	DHA; F.O. for Public Health	GMO-derived additives & processing aids	Contains a definition of GMO's (genetically modified organisms) and GMO-products, which includes purified chemicals ex GMO-fermentation; submits them to approval.
Ord. on Commodities 817.04	01.03.95	DHA; F.O. for Public Health	Chemicals contained in commodities	Addresses classes of materials (e.g. metals) used in preparing commodities & classes of uses; focus on protection of consumers' health; defines limiting concentrations for components; addresses labelling; assigns responsibility to Cantons.
Ord. on Materials and Objects Made of Plastics 817.041.1	26.06.95	DHA; F.O. for Public Health	Polymers, monomers	Addresses polymers which may be used in food processing, packaging, etc.; sets limits for monomers and additives; defines list of allowed types of plastics.

Annex I Table 2 (continued – focus on food, consumer goods, poisons, and industrial goods)

Legal Instrument & SR-Number *)	**Relevant Articles/ Date **)**	**Responsible Ministries/ Bodies**	**Chemical Use Categories Covered**	**(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks**
Ord. on Cosmetics 817.042.1	26.06.95	DHA; F.O. for Public Health	Cosmetic ingredients	Contains positive lists of colorants, UV-screens, preservatives with maximum use concentrations plus negative list with about 350 forbidden ingredients or classes of ingredients.
F.L. on Toxic Substances 813.0	21.03.69	DHA; F.O. for Public Health	Poisonous chemicals	Defines poison classes (1–5) and the federal list of poisons; sets rules re. the handling of substances in these classes and products containing them.
Ord. on Toxic Substances 813.01	19.09.83	DHA; F.O. for Public Health	Poisonous chemicals	Sets the rules re. the classification (1-5) and the handling of the classes incl. registration, distribution, protection, due diligence, and fostering information;addresses duties of companies/institutions handling the substances, protection of workers, GLP; inspections by Cantons.
Ord. on Forbidden Toxic Substances 813.39	23.12.71	DHA; F.O. for Public Health	Poisonous chemicals	Addresses specific substances and uses: e.g. „no bromo-methane in fire extinguishers“ (compare table 4.C below).
Ord. on Material Safety Data Sheets 813.013.4	9.11.98	DHA; F.O. for Public Health	Industrial chemicals	Defines industry’s duty to provide MSDS’s for all the toxic or hazardous chemicals it handles.
Ord. on Special Labelling of Industrial Poisons 814.842.21	10.01.94	DHA; F.O. for Public Health	Industrial chemicals	Specific rules for labelling of pallet loads of poisonous substances and products; addresses specifically EU-requirements, i.e. their acceptance in Switzerland.

Annex I Table 2 (continued – focus on food, consumer goods, poisons, and industrial goods)

Legal Instrument & SR-Number *)	**Relevant Articles/ Date **)**	**Responsible Ministries/ Bodies**	**Chemical Use Categories Covered**	**(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks**
Ord. on Simplifications re. the Labelling of Pallets of Poisons of Classes 2 – 5 814.842.25	17.05.76	DHA; F.O. for Public Health	Industrial chemicals	Specific rules for labelling of pallet loads of poisonous substances.
Ord. on Smplifications re. Subcontraction of Stocking of Toxic Substances 814.842.41	04.07.73	DHA; F.O. for Public Health	Chemicals used by chemical industry & trade	Addresses especially aspects of health insurance of concerned workers (based on F.L. on Health Insurance).
F.L. on Explosives **941.41**	25.03.77	DDPS; DJP	Explosives	Submits production of and trade in explosives to federal control and taxation; delineates definition of substances as either poisons or explosives, respectively; includes pyrotechnical objects, but excludes military use.
Ord. on Explosives 941.411	26.03.80	DDPS; DJP; Office of the Federal Prosecutor	Explosives	Defines explosive substances (like TNT), components (like explosion initiators), and objects; sets safety standards and addresses technical or industrial uses; sets limits regarding minimum energy required to provoke explosion (friction: > 2J); regulates permits regarding importation, production, sales, and use.

Annex I Table 3: References to Existing Legal Instruments Addressing the Management of Chemicals – Focus on Drugs and Health incl. Occupational Health

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
Intercantonal Agreement on Drug Control 812.101	03.06.71	Health Ministries of the Cantons (approval by CH)	Drugs	Addresses the control of medication; expresses the principle of coordination & mutual recognition; includes all Cantons & the Principality of Lichtenstein; forms the basis for the Intercantonal Office for the Control of Medicines; defines the registration principles.
Ord. on Immuno-biological Products 812.111	23.08.89	DHA; F.O. for Public Health	Antibodies, sera	CH controls vaccines, antigens, toxins and antitoxins, sera and non-antibiotic immunoglobulins; addresses principles re-garding production, quality assurance etc.; F.O. for Public Health takes care of registration / batch control.
F.C.-Decr. on Di-oxydiamino-arsenobenzene and Other Tri-valent Arseno-organics 812.112	17.12.51	DHA; F.O. for Public Health	Arseno-organics	Preparations for injection in humans are submitted to control by the F.O. for Public Health; Cantons collect samples. Related ordinances: SR 812.112.1 and SR 812.112.2
F.L. on Narcotics and Psychotropic Substances 812.121	03.10.51	DHA; F.O. for Public Health	Narcotics & psycho-tropic substances	CH controls trade and use of narcotics and psychotropic drugs; submits application to MD's restrictive prescription and obliges pharmacists/professionals to careful protection of and book-keeping on stocks. Cantons take care of the implementation.
Ord. on Narcotics and Psychotropic Substances 812.121.1	29.05.96	DHA; F.O. for Public Health	Narcotics and psychotropic substances	Contains definitions of lists; describes the principles regarding trade and approvals. Compare table 4.A.7 concerning imports and exports.

Annex I Table 3 (continued – focus on drugs and health incl. occupational health)

Legal Instrument & SR-Number *)	**Relevant Articles/ Date **)**	**Responsible Ministries/ Bodies**	**Chemical Use Categories Covered**	**(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks**
FOPH-Ord. on Narcotics 812.121.2	12.12.96	DHA; F.O. for Public Health	Narcotics and psychotropic substances	CH sets limits; Cantons take care of the implementation. Annex contains lists (forbidden – subject to prescription – free in small amounts); > 400 products mentioned.
F.L. on Alcohol 680	21.06.32	DF; F. Alcohol Administration	Ethanol	CH taxes and controls production of and trade in drinkable alcohol in order to prevent alcoholism. Part of the respective income is used by the Cantons for controlling alcoholism (Ord. SR 689.3). Customs authorities control importation.
F.L. on Epidemic Diseases 818.101	18.12.70	DHA; F.O. for Public Health	Drugs, vaccines	CH takes measures regarding stocks of immunobiological products; production and trade require permit; F.O. for Public Health has list of accepted products incl. disinfectants.
F.Dec. on the Control of Blood, Blood Products and Transplants 818.111	22.03.96	DHA; F.O. for Public Health	Products derived from blood	Addresses mainly donation of blood; defines due diligence with regard to blood-derived products (absence of pathogenic components); inspectorate and laboratory at level of CH inform IKS as well as the Cantons. The ord. SR 818.111.2 regulates testing procedures.
F.L. on Health Insurance **832.10**	18.03.94	DHA; F.O. for Public Health; State Secr. for Econ. Affairs	Poisons and hazardous products (implicitely)	Defines, i.a., the principle of the list of specialities covered by the compulsory health insurance.
Ord. on Health Insurance 832.102	27.06.96	DHA; F.O. for Public Health; State Secr. for Econ. Affairs	Poisons and hazardous products (implicitely)	The list of covered specialities is re-edited twice a year; Swiss registration is mandatory.
F.L. on Insurance Against Accidents 832.20	20.03.81	DHA; State Secretariat for Economic Affairs	Poisons and hazardous products (implicitely)	Defines the National Accident Insurance Fund for employees (SUVA), its tax-free status, its payments, and ist board; Art. 85 submits prevention of occupational accidents to authority of SUVA and the F.O. implementing the F.L. on employment.

Annex I Table 3 (continued – focus on drugs and health incl. occupational health)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
F.L. on Work in Industry and Trade 822.11	Art. 6 – 8 13.03.64	DEA; State Secretariat for Economic Affairs	Poisonous industrial chemicals (Implicitely)	Industrial employers are obliged to protect employees' health; have to get cantonal permit to run their operation. Requirements include details regarding construction of buildings etc. Special topics are covered by separate ordinances.
Regulation regarding the Board of the Swiss National Accident Insurance Fund (Suva) 832.207	24.03.83	DHA, DEA	Poisonous industrial chemicals (implicitely)	Mission and composition of the Board (16 from the employers' and 16 from the employees' association, 8 from the Confederation) are defined by the Federal Law; some additional procedural aspects are mentioned.
Ord. on Prevention of Accidents and Occupational Diseases 832.30	19.12.83	DHA; Board of the Swiss Accident Insurance	Industrial chemicals	Addresses measures of protection; defines 25 types of industrial operations, i.a. handling explosives, handling large amounts of solvents, belonging to the chemical industry, producing plastics; gives corresponding regulatory authority to SUVA (e.g. setting limits for maximum work-place concentrations of chemicals).
DHA-Decr. on Technical Measures Preventing Occupational Diseases Caused by Chemicals 832.321.11	26.12.60	DHA	Industrial chemicals	Asks for replacement of toxic substances by less toxic ones, wherever adequate; defines collective and individual measures to protect workers; enforces maximum work-place concentrations; asks for specific installations (showers etc.).

Annex I Table 4: References to Existing Legal Instruments Addressing the Management of Chemicals – Focus on Agriculture and on the Environment

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
F.L. on Fostering Agriculture and Farmers' Professional Existence 910.1	Esp. Art. 70 and following - 03.10.51	DEA; F.O. for Agriculture	Fertilizers and pesticides (agricultural additives)	Farmers' due diligence; Cantons' duty to assist/control; producers' due diligence and duty to inform. F.L. defines in addition the standing commission; addresses professional education, research, national supplies, labelling of „bio-products" etc., and pricing.
Compendium of Agricultural Processing Aids/ Pesticides 916.052	29.08.77	DEA; F.O. for Agriculture	Processing aids, pesticides	Proviso: F.L. on Toxic Substances. Regulates labelling; contains positive list of products like sulfur-, copper-, or carbonate-con-taining ones; refers to the authority of the Research Institute in Wädenswil regarding information to be provided along with the products.
Ord. on Commercializing Plant Treatment Products 916.161	26.01.94	DEA; F.O. for Agriculture	Agricultural chemicals	Submits products to control (excl. products for exportation only). Products containing exclusively components on the positive list of the F. O. may be distributed without permission (but notification!); others have to get permission; F.O. responsible for environment to be contacted in parallel.
Ord. on Commercializing Fertilizers and Equivalent Products 916.171	26.01.94	DEA; F.O. for Agriculture	Fertilizers, sewage sludge, waste incineration slags	Submits fertilizers to control; Department defines positive list, sets limits, and defines test and sampling procedures; applications to be addressed to the Research Institute (Bern Liebefeld); producers' duty to provide information.

Annex I Table 4 (continued – focus on agriculture and on the environment)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
DEA-Ord. on Fertilizers and Equivalent Products (Fertilizer Compendium) 916.171.1	08.05.95	DEA; F.O. for Agriculture	Fertilizers and equivalent products	Adapts sampling procedure to EG-Directive 77/535; contains 8 lists of products which require notification only (mineral fertilizers, single nutrient fertilizers, multiple nutrient fertilizers etc.). Tolerated limits defined in the annex.
Ord. on Plant Protection 916.20	05.03.62	DEA; F.O. for Agriculture	Agricultural products ≠ chemicals	Addresses types of organisms and plants as well as Cantons' plant protection service. Principle: protection of cultures, collaboration with Research Institutes.
DEA-Ord. on Feed and Additives (Feed Compendium) 916.307.1	01.03.95	DEA; F.O. for Agriculture	Feed additives	Addresses products and premixes, producers duty to keep records on additives, and declaration incl. contents of actives.
F.L. on Environmental Protection 814.01	07.10.83	DETEC; SAEFL	All as well as subclasses specifically (pollutants, waste...)	Protection of humans, animals, plants, and their environments against damaging impacts; polluter-pays-principle; participation of Cantons.
Ord. on Environmetally Hazardous Substances 814.013	09.06.86	DETEC; SAEFL	Essentially all; annexes mention specific products and use categories like plant and wood treatment, plastics ...	Protection of humans, animals, plants, and their habitats incl. soil against negative effects of environmentally hazardous substances; regulates their assessment and handling incl. permission and restrictions; defines due diligence and control incl. significance of self-control; attributes responsibilities to CH and to the Cantons.

Annex I Table 4 (continued – focus on agriculture and on the environment)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
Ord. on Air Pollution Control 814.318.142.1	16.12.85 amended in 1992 and 1998	DETEC; SAEFL	Fuels and volatile chemicals from industry and (waste) incineration	Protection of clean air; defining emission limits as well as analytical procedures and calculations to be applied in their determination; defines measures in cases of excessive results; contains lists of chemicals/products; assigns responsibilities to CH and Cantons.
Ord. on Incentive Taxes concerning VOC's 814.018	12.11.97	DETEC; SAEFL	Volatile organic chemicals	Defines VOC-incentive tax, VOC's, and the VOC-balance sheet to be provided by companies applying for refunds. Annexes contain positive lists of low and high boiling VOC's (common solvents) as well as customs tarif numbers of mixtures or preparations charged with the incentive tax.
Ord. on Incentive Taxes concerning Fuel Oil „Extra-Light" 814.019	12.11.97	DETEC; SAEFL	Light oil containing > 0.1% sulfur	Submits imports of oils „extra light" containing > 0.1% sulfur to a special tax.
Ord. on Soil Pollutants 814.12	09.06.86	DETEC: SAEFL	Especially fertilizers (metal contents!)	Defines fertile soil and mission of CH (Research Institutes) to monitor soil pollution; sets limits re. pollutants; defines measures in case of high concentration of pollutants.
F.L. on Protection of Waters 814.20	Art. 22 & foll., Art. 27 24.01.91	DETEC; SAEFL	Hazardous liquids; pesticides & fertilizers	Storage of potentially hazardous liquids; inclusion of hazardous substances (in solution); avoiding negative impact of fertilizers and pesticides; delegation of control function to Cantons.
Ord. on Protection of Waters 814.201	28.10.98	DETEC; SAEFL	Chemicals ending up in discharged water as well as dung etc.	Protection of waters; fostering waste water purification; assigning responsibility to CH as well as Cantons; addressing contamination and use of sewage sludge; setting limits re. pollutants; defining ground water protection zones, water quality, and methods of determination of the latter.

Annex I Table 4 (continued – focus on agriculture and on the environment)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
Ord. on Protection of Waters Against Hazardous Liquids 814.202	01.07.98	DETEC; SAEFL	Liquid industrial chemicals incl. petroleum products	Definition of liquids which may impair water quality; protection of waters: Class 1 (small amounts are hazardous), class 2 (large amounts are hazardous). Defines in addition technical stocking requirements.
Dept. Ord. on Classification of Liquids Hazardous to Waters 814.226.212.1	28.09.81	DETEC; SAEFL	Implicitely all, especially products impairing water quality or toxic for organisms in water	Defines criteria to assess properties of chemicals (sensory aspects, biodegradability, toxicity to aquatic organisms ...); mentions list of hazardous products to be published.
Dept. Ord. on Judging Biodegradability of Detergents 814.226.227	15.06.77	DETEC; SAEFL	Detergents and similar products	Refers to the OECD-method of testing; defines the Institute in charge (EMPA, St. Gallen).
F.L. on Protection Against Ionizing Radiation 814.50	22.03.91	DHA; F.O. for Public Health	Radioactive products	Defines the objectives of protection (humans, environment, professionally exposed personnel); includes medical applications.
Ord. on Protection Against Ionizing Radiation 814.501	22.06.94	DHA; F.O. for Public Health	Radioactive products	Defines the Commission for Protection Against Ionizing Radiation; addresses radiating products as well as containers. The annex defines so-called free limits of individual nuclei.

Annex I Table 5: References to Existing Legal Instruments Addressing the Management of Chemicals – Focus on Wastes, Preventing Major Accidents, Transportation, and Warning Mechanisms

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
Dept. Ord. on Radioactive Wastes To Be Turned In 814.557	08.07.96	DHA		Defines the Paul Scherrer Institute as the organization in charge. Regulates labelling and separation of materials according to factor above the free limit and to toxicity.
Ord. on Movements of Special Wastes 814.610 (old: 814.014)	12.11.86	DETEC; SAEFL	All types of special wastes according to code	Addresses delivery, acceptance, transportation, import, export; defines due diligence and attributes code numbers to types of wastes (annex 2); addresses forms to accompany transported wastes (annex 1); defines responsibility of CH and Cantons.
Technical Ord. on Waste 814.015	10.12.90	DETEC; SAEFL	All types of waste	Defines types of wastes and treatments (temporary storage, landfills, incineration, recovery, composting); encourages incineration); sets concentration limits for landfills; delegates responsibilities to Cantons.
Ord. on Recycling and Disposal of Electric/Electronic Equipment 814.016	14.01.98	DETEC; SAEFL	Chemicals contained in electronic equipment (PCB ...)	Reduction of wastes and separation from household garbage; addresses mandatory returning and recycling as well as due diligence regarding disposal; defines required permits regarding disposal and forms to accompany exported items; Cantons and customs authorities assist in implementation.
Ord. on Beverage Containers 814.017	22.08.90	DETEC; SAEFL	Esp. „one way“ PET bottles and aluminum cans	Reduction of waste; recycling; requirement of environmentally harmless incineration depending on numbers of bottles, cans, etc. of given types.

Annex I Table 5 (continued - focus on wastes, preventing major accidents, transportation, and warning mechanisms)

Legal Instrument & SR-Number *)	**Relevant Articles/ Date **)**	**Responsible Ministries/ Bodies**	**Chemical Use Categories Covered**	**(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks**
Dept. Ord. on Stocking and Moving Liquids Hazardous to Waters 814.226.211	21.06.90	DETEC; SAEFL	Fuels and other chemicals stored as liquids or in solution	Technical requirements re. tanks for storage and transportation of liquids impairing water quality (cp. table 4.A.4, SR 814.20 and following).
Ord. on Environmental Impact Assessments 814.011	19.12.88	DETEC; SAEFL	Chemicals to be (being) synthesized processed or stocked	Regulation of need of and procedures of environmental impact assessment of installations to be constructed or changed; re. installations above a certain tonnage or size; delegation of important duties to Cantons.
Ord. on Protection Against Major Accidents 814.012	27.02.91	DETEC; SAEFL	Flammable, corrosive, toxic or environmentally hazardous products	Protection of public and environment against serious damage resulting from major chemicals-related accidents by preventing them and minimizing the consequences; assigning responsibility to the owner; controlled by the enforcement authority of the Canton and linked to above-threshold amounts as defined for given substances or chemical risks, respectively.
Ord. on Street Transports of Dangerous Goods 741.621	17.04.85	DETEC; SAEFL	Flammable, corrosive, toxic, or environmentally hazardous products	Refers to definition of dangerous goods according to other legal provisions and international treaties; defines restricted routes, information requirements and due diligence; assigns implementation to Cantons.
F.L. on Transportation in Public Traffic 742.40	04.10.85	DETEC; F.O. for Transport	Implicitely all	Assigns responsibility to the Federal Office for Transport. Defines the so-called freight contract and the liabilities.

Annex I Table 5 (continued - focus on wastes, preventing major accidents, transportation, and warning mechanisms)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
F.L. on the Swiss Federal Rail-ways 742.31	23.06.44	DETEC; Swiss F. Railways	Implicitely all	Defines the general mission, independence, and authority of the organization. Principle of orientation along the technical state-of-the-art.
Ord. on Railway Transports of Dangerous Goods 742.401.6	03.12.96	DETEC; F.O. for Transport; SAEFL	Flammable, cor-rosive, toxic, or environmentally hazardous products	International guidelines (RID) are applicable. Defines the Federal Inspectorate for Dangerous Goods (Dübendorf). Regards especially the Swiss Federal Railways.
F.L. on Pipelines for Liquid and Gaseous Fuels 746.1	04.10.63	DETEC; F.O. of Energy	Especially methane	Defines mandatory federal approval depending on pressure in and length of pipeline.
Ord. on Pipelines 746.11	11.09.68	DETEC; F.O. of Energy	Esp. methane	Regulates permits and application. Defines the Federal In-spectorate for Pipelines (service center within the SVTI (Swiss Association for Technical Inspections).
Ord. on Shipping Dangerous Goods on the Rhein 747.224.141	15.02.94	DETEC; F.O. for Transport	Especially flammable or corrosive products	Risks are assessed & controlled with regard to geographically defined waters. „Rhein“ includes the part from Basle to the sea. A separate Ord. (SR 747.224.241) adds the part Basle-Rheinfelden, where transportation on water is playing a role.
Ord. on Shipping Dangerous Goods on the seas 747.354.3	10.01.73	DETEC; F.O. for Transport	Esp. dangerous goods	Concerns ships under Swiss flag transporting goods on international seas.

Annex I Table 5 (continued - focus on wastes, preventing major accidents, transportation, and warning mechanisms)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
Ord. on Air Transports 748.411	03.10.52	DETEC; F.O. for Civil Aviation	See remarks!	Forbidding transportation of explosive, flammable, radioactive, or sensorially untolerable products. Exceptions have to be granted by the Federal Office for Civil Aviation.
Ord. on the National Emergency Operations Centre 732.34	03.12.90	DDPS; National Emergency Operations Centre (NEOC) = NAZ	See remarks!	The NEOC is in charge of handling increased levels of ionizing radiation. ARMA, associated with the Swiss Meteorological Establishment, serves as the institution to which chemical accidents have to be immediately reported and is functionally a section of the NEOC.

Annex I Table 6: References to Existing Legal Instruments Addressing the Management of Chemicals – Focus on Weights and Measures, Accreditation, and Professional Training

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
F.L. on Measuring 941.20	09.06.77	DJP; F.O. of Metrology	Implicitely all	Target: definig units (international system) and requirements regarding measuring devices.
Ord. on Qualification of Measuring Devices 941.210	17.12.84	DJP; ; F.O. of Metrology	Implicitely all	Defines what has to be qualified and how it has to be done. Control by the F.O. of Metrology and by the cantonal calibration offices. Related ordinances SR 941.212 and SR 941.241 address the measuring of liquids and gases, respectively.
Ord. on Measurement and Declaration of the Quantity of Measurable Goods in Commercial Transactions 941.281	08.06.98	DJP; ; F.O. of Metrology	Implicitely all	Defines conditions and tolerable errors according to type of device or sale. Technical requirements are regulated by the ordinance SR 941.281.1.
Ord. on Accreditation and Designation 946.512	17.06.96	DJP; ; F.O. of Metrology	Implicitely all	Defines the accreditation system and the designation of testing laboratories as well as bodies of conformity evaluation, of registration, and of homologation.
Ord. on Mission and Authority of Cantons regarding Metrology 941.292	25.06.80	DJP; ; F.O. of Metrology	Implicitely all	Requires at least one calibration office per Canton (joint organization possible); defines stamps and reports to be created.

Annex I Table 6 (continued - focus on weights and measures, accreditation, and professional training)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
F.L. on Pharmacopoeia 812.21	06.10.89	DHA; F.O. for Public Health	Drugs	The Federal Council acts as the formal editor. Drugs mentioned in the Pharmacopoeia and sold in Switzerland have to be in agreement with its requirements.
Ord. on Issueing the Pharmacopoeia 812.211	20.08.97	DHA; F.O. for Public Health	Drugs	Actually valid are - Pharmacopoeia Europaea Ed. 3 (June 96) - Pharmacopoeia Helvetica Ed. 8 (August 97)
Ord. on the Federal Pharmacopoeia Commission and Laboratory 812.24	06.12.93	DHA; F.O. for Public Health	Drugs	The commission has up to 15 members who are named by the Federal Council. It has to collaborate with the corresponding European commission and with IKS, universities, the pharmaceutical industry etc. Definition of expert groups and of the Pharmacopoeia Laboratory.
General Ord. on Examinations in Medicinal Professions 811.112.1	19.11.80	DHA; F.O. for Public Health	Drugs, diagnostics and related products	Defines educational and civil prerequisites as well as rules and objectives. Separate ordinances cover medical doctors (SR 811.112.24), dentists (811.112.3), veterinarians (SR 811.112.4), and pharmacists (SR 811.112.5).
Ord. on the Federal Diploma of Food Chemists 817.92	17.04.91	DHA; F.O. for Education and Science	Food components and additives	Defines educational and civil prerequisites as well as rules and objectives. Separate ordinances cover food inspectors (SR 817.93) and the minimum requirements regarding food controllers (SR 817.48).

Annex I Table 6 (continued - focus on weights and measures, accreditation, and professional training)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
Dept. Ord.'s on Examinations Required to Handle Poisons 814.832.521 resp. ....531. ... resp. ....532. ... resp. ....533. ...		DHA; F.O. for Public Health	Implicitely all	E.g.: Ord. ... .521 ⇒ general approval type B;Ord. ... .531.7 ⇒ approval for agricultural and horticultural use; Ord. ... .531.21 ⇒ approval to use pesticides and wood protectants in forestry (significant restrictions!); Ord. ... .533.5 ⇒ approval regarding trade of chemicals in large volumes; etc. Altogether more than 20 ordinances going back to the mid-70'ies.
Dept. Ord. on Professional Approval to Use Wood Protectants 814.013.51	17.05.91	DHA; DEA	Wood protectants (pesticides, refrigerants)	A series of 5 additional ordinances (SR 814.013.5 ..) cover the requirement of professional education and eventual examinations in the context of the use of the additional chemicals (use categories mentioned in brackets) in agriculture, forestry, horticulture, etc.

Annex I Table 7: References to Existing Legal Instruments Addressing the Management of Chemicals – Focus on Supplies, Trade incl. Imports and Exports, and Liability

Legal Instrument & SR-Number *)	**Relevant Articles/ Date **)**	**Responsible Ministries/ Bodies**	**Chemical Use Categories Covered**	**(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks**
F.L. on National Supplies 531	08.10.82	DDPS; DEA	Essential goods (fuels, ...)	Defines principle of holding supplies and warranting imports. Derived ordinances concern fertilizers, antibiotics, fuels, and soaps and detergents.
Ord. on obligatory Stocks of Liquid Fuels 531.215.41	06.07.83	DDPS; DEA	Liquid fuels	Defines principles, volumes, control. Separate ordinances cover solid fuels and lubricants.
Intercantonal Agreement on Salt 691	22.11.73	Cantonal Ministries of Economy	Cooking salt (sodium chloride)	Submits trade in salt to the authority of the Cantons. A very large number of them are jointly purchasing salt and controlling its quality (role of Rheinsalinen!).
F.L. on Measures regarding International Economy and Trade 946.201	25.06.82	DEA	Implicitely all imported or exported chemicals	The Federal Council may decide on controlling or defensive measures and edits decrees to enforce international agreements.
F.L. on the Control of Dual-Use Goods 946.202	13.12.96	DEA, DDPS	Implicitely all imported or exported chemicals	Allows the Department (DEA) to differentiate the control of products from differing countries and to grant import/export permits.
Ord. on the Control of Dual-Use Goods 946.202.1	25.06.97	DEA	Goods incl. those to be used in civil as well as military sector	Concerns the principles concerning single as well as general permits re. importation or exportation; includes regulation of especially mentioned goods.

Annex I Table 7 (continued - focus on supplies, trade incl. imports and exports, and liability)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
Ord. on the Control of Chemicals 946.202.21	03.09.97	DEA, DDPS	Chemicals to be used in civil as well as military sector	Implements the Chemical Weapons Convention, CWC (13.01.93).
Dept. Ord. on Control of Chemicals 946.202.211	12.09.97	DEA	Chemicals to be used in civil as well as military sector; incl. precursors	Defines the import and export rules for the scheduled chemicals (schedule 1 – 3) of the CWC.
Ord. on Pre-Cursors of Nar-cotics and Psychotropics 812.121.3	29.05.96	DHA, DEA	Narcotics, psycho-Tropic drugs, and pre-cursors	Single as well as general permits for importation or exportation depending on declaration regarding use; follow-up to Vienna-agreements of 1988 and 1992.- Limitations defined and permits required for final products as well (compare table 4.A.3, SR 812.121).
F.L. on Technical Trade Barriers 946.51	06.10.95	DEA	Implicitely all	Principle to avoid trade barriers based on unnecessary technical requirements. Delegation of competence to the Federal Council. Definition of a control office.
Ord. on the Swiss System of Ac-creditation and Defining Test, Conformity, Sub-mission and Ap-proval Agencies 946.512	17.06.96	DEA	Implicitely all	Addresses judgement of conformity and mutual recognition of testing and accreditation institutions. The Swiss Accreditation Office is organizationally integrated in th Swiss F.O. of Metrology. ⇒ Cp. Annex I, Table 6!

Annex I Table 7 (continued - focus on supplies, trade incl. imports and exports, and liability)

Legal Instrument & SR-Number *)	Relevant Articles/ Date **)	Responsible Ministries/ Bodies	Chemical Use Categories Covered	(Potentially) Chemicals-related Aspects of the Objectives of the Legislation – Remarks
Jurisdiction on Obligations (OR) 220	Art. 55 30.03.11	DJP	Implicitely all	Responsible business owner's liability for damage due to execution of business; due diligence.
F.L. on Product Liability 221.112.944	18.06.93	DJP	Implicitely all	Sets the principle of producer's liability for damage caused by the product (limitation in time: ten years as from the selling date).
F.L. on Information of Consumers 944.0	05.10.90	DEA	Implicitely all	Sets the target of objective information of consumers; mentions consumer organizations, defines their financial support, and defines a respective federal commission.

***)** **SR-numbers** refer to the Systematic Register [Amtliche Sammlung des Bundesrechts und Systematische Sammlung des Bundesrechts – Systematisches Register 1997 (Ed. Federal Chancellery, 1998 available from EDMZ, CH-3000 Bern)]. This register contains the titles of the complete compilation of laws and ordinances as available in several federal offices and libraries. In addition, its numbering system indicates legal connectivities.
Cp. page 143 for **abbreviations!**

****)** **Dates** in the above tables 1 – 7 are issuing dates, and later adaptations have in many cases been made.

Annex II: Glossary

Agriculture	Is mostly addressing farming and excluding private gardening; may include forestry here or there.
Biocides	The term is avoided wherever possible. It may be used to address substances killing microorganisms in other applications than plant protection, while the respective plant protectants are normally termed pesticides. Not used in this National Profile is the distinction antibiotics / biocides / biostatics, which differentiates in essence the efficacy of the respective products.
Canton	Member state of the Swiss Confederation – politically comparable to the States in the US.
Chemicals	There is no non-chemical material thing, but the term chemical is normally used to designate substances or mixtures prepared, extracted, or at least concentrated by man. It may eventually include living microorganisms. Cp. chapter 14, page 108.
Commercial	**See** „Products“!
Confederation	The federation of Cantons forming the Swiss nation. In other words: the state of Switzerland.- The abbreviation CH stands for *Confoederatio Helvetica*, i.e. the Helvetic (= Swiss) Confederation.
Department	In the political context used to designate one of the seven Swiss ministries.
Federal Council	The Swiss council of ministers, i.e. the executive government consisting of the heads of the seven Departments.
Employee	The term is in this National Profile normally addressing all the people belonging to the working population, but not owning the respective business. Thus, it is including, e.g., unionized workers, where not otherwise explicitely stated. It may include owners in some of the statistical figures.
Health Insurance	Addressing protection against the costs of illness (treatment etc.) and possibly accidents, but excluding social security (cp. below).

Annex II: Glossary (continued)

Initiative	In the political context the specific act of proposing new legislation.
Pesticides	Generally addressing plant treatment products used to protect the plants against diseases. Includes anti-bacterial and antifungal products and often herbicides as well. May eventually include non-agricultural uses of antimicrobials.
Poison	According to Swiss legislation any substance or mixture of *per se* toxicity below 5 g / kg in rodents or any substance or mixture with known negative impact upon human or animal health.
Products	„Products“ covers the whole range from individual chemicals to complex systems or installations. Commercial products may either be industrial or consumer products. Thus, „commercial“ is implying sales, but not necessarily sales directly to consumers.
Social Security	Addressing the respective organizations of the Confederation, which provide for the elderly, the disabiliated, or the unemployed. Suva, the Swiss accident insurance for employees, is implicitely included, though it is not at the same level (not available to everybody). Finally, poverty is handled by the municipal level, but it has, of course, still to be mentioned in this context.
Technical College	Specific Swiss type of usually cantonal colleges offering higher technical education especially to students who have successfully completed a corresponding professional apprenticeship. Graduates have the title Engineer HTL (HTL = Höhere Technische Lehranstalt). New legislation (the so-called Fachhochschul-Gesetz) is currently being implemented and transforming the status of the Swiss Technical Colleges.

Annex III: Abbreviations

AG	Aargau (see list of Cantons on page 12 or 32)
AI	Appenzell Innerrhoden (see list of Cantons on page 12 or 32)
AL	Alps
AR	Appenzell Ausserrhoden (see list of Cantons on page 12 or 32)
ARMA	Alarmstelle der Schweizerischen Meteorologischen Anstalt = Alert Office of the Swiss Meteorological Establishment
Art.	Article
BE	Bern, Berne (see list of Cantons on page 12 or 32)
BL	Basel Landschaft, Basle Countryside (see list of Cantons on page 12 or 32)
BS	Basel Stadt, Basle Town (see list of Cantons on page 12 or 32)
CEFIC	Conseil Européen des Fédérations de l'Industrie Chimique = European Council of Federations of the Chemical Industry
CH	*Confoederatio Helvetica* = Swiss Confederation
chem.	chemical
Comm.	Commerce
CSD	United Nations Commission for Sustainable Development
DDD	Dichlorodiphenyl-dichloroethane
DDE	Dichlorodiphenyl-dichloroethylene
DDPS	Department of Defence, Protection of the Population and Sports
DDT	Dichlorodiphenyl-trichloroethane
DEA	Department of Economic Affairs
DETEC	Department of Environment, Transport, Energy and Communications
DF	Department of Finance
DFA	Department of Foreign Affairs
DHA	Department of Home Affairs
DJP	Department of Justice and Police
DNA	Desoxyribonucleic acid
EAWAG	Eidgenössische Anstalt für Wasserversorgung, Abwasser-reinigung und Gewässerschutz = Federal Institute for Environmental Science and Technology
EDMZ	Eidgenössische Drucksachen- und Materialzentrale = Swiss Federal Printing and Supply Office
EDTA	Ethylenediamine-tetraacetic acid
EINECS	European Inventory of Existing Commercial Substances
EMPA	Eidgenössische Materialprüfungsanstalt = Federal Laboratories for Materials Testing and Research
ETH	Eidgenössische Technische Hochschule = Swiss Federal Institute of Technology
ETHICS	ETH Library Information Control System
EU	European Union

Annex III: Abbreviations (continued)

exc.	exception
F.	Federal
F. Dec.	Federal Decision
F.C. Decr.	Federal Council Decree
F.L.	Federal Law
F.O.	Federal Office
FAO	Food and Agriculture Organization of the United Nations
FCHC	Fluorochloro-hydrocarbons
FOA	Federal Office of Agriculture
FOPH	Federal Office for Public Health
FR	Fribourg (see list of Cantons on page 12 or 32)
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GE	Genève (see list of Cantons on page 12 or 32)
GL	Glarus (see list of Cantons on page 12 or 32)
GLP	Good Laboratory Practice
GMO	Genetically Modified Organism
GMP	Good Manufacturing Practice
GR	Graubünden (see list of Cantons on page 12 or 32)
ICCA	International Council of Chemical Association
IFCS	Intergovernmental Forum on Chemical Safety
IGS	Inventar Gefährlicher Substanzen (inventory of dangerous substances)
IKS	Interkantonale Kontrollstelle = Intercantonal Office for the Control of Medicines
ILO	International Labour Office
Ind.	Industry
IOMC	Inter-Organization programme for the sound Management of Chemicals
JU	Jura (see list of Cantons on page 12 or 32)
JU	Jura
LA	Law on Agriculture
LCG	Law on Control of Commercial Goods
LEP	Law on Environmental Protection
LNP	Law on Narcotics and Psychotropic Substances
LNS	Law on National Supplies
LPW	Law on Protection of Waters
LTS	Law on Toxic Substances
LU	Luzern, Lucerne (see list of Cantons on page 12 or 32)
MAK	Maximale Arbeitsplatz-Konzentration = Maximum Workplace Concentration
NAZ (= NEOC)	Nationale Alarmzentrale (Natl. Emergency Operations Centre)
NE	Neuchâtel (see list of Cantons on page 12 or 32)
NOGA	Nomenclature générale des Activités (économiques) = General Nomenclature of (economic) Activities, i.e. a system of classification of activities (counting 5 levels today and 734 positions all in all)

Annex III: Abbreviations (continued)

NTA	Nitrilo-triacetic acid
NW	Nidwalden (see list of Cantons on page 12 or 32)
OAP	Ordinance on Air Pollution Control
OCC	Ordinance on Control of Chemicals
OECD	Organization for Economic Cooperation and Development
OFTS	Ordinance on Forbidden Toxic Substances
OHS	Ordinance on Environmentally Hazardous Substances
OMA	Ordinance on Protection Against Major Accidents
OMW	Ordinance on Movement of Special Waste
ONP	Ordinance on Precursors of Narcotics and Psychotropic Substances
OPL	Ordinance on Protection of Waters Against Hazardous Liquids
OPP	Ordinance on Plant Protection
OPS = OTS	Ordinance on Poisonous Substances
OPW	Ordinance on Protection of Waters
OR	Obligationenrecht = Code of Obligations
Ord.	Ordinance
OTS	Ordinance on Toxic Substances
OW	Obwalden (see list of Cantons on page 12 or 32)
PA	Pre-Alps
PCB	Polychlorinated biphenyls
PCP	Polychlorinated phenols
PET	Polyethylene-terephthalate
PL	Plateau (German: Mittelland)
Prod.	Products
R&D	Research and Development
RNA	Ribonucleic acid
SA	South of the Alps
SAEFL	Swiss Agency for the Environment, Forests and Landscape
SG	St. Gallen (see list of Cantons on page 12 or 32)
SH	Schaffhausen (see list of Cantons on page 12 or 32)
SO	Solothurn (see list of Cantons on page 12 or 32)
SR	Systematic Register (of laws, ordinances etc.)
SSCI = SGCI	Swiss Society of Chemical Industries = Schweiz. Gesellschaft für Chemische Industrie
Subst.	Substance
Suva	Schweizerische Unfallversicherungsanstalt = Swiss National Accident Insurance Fund
SZ	Schwyz (see list of Cantons on page 12 or 32)
TG	Thurgau (see list of Cantons on page 12 or 32)
TI	Ticino (see list of Cantons on page 12 or 32)
TNT	Trinitrotoluene
UN	United Nations
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research

Annex III: Abbreviations (continued)

UR	Uri (see list of Cantons on page 12 or 32)
VD	Vaud (see list of Cantons on page 12 or 32)
VOC	Volatile Organic Compound
VS	Valais (see list of Cantons on page 12 or 32)
WHO	World Health Organization
WTO	World Trade Organization
ZG	Zug (see list of Cantons on page 12 or 32)
ZH	Zürich, Zurich (see list of Cantons on page 12 or 32)

Annex IV: List of Organizations

A. Federal Offices Agencies etc.

Abbreviation (English in brackets)	Name	Address
BK (FCL)	Bundeskanzlei ⇒ Federal Chancellery	BK Bundeshaus West CH-3003 Bern Tel: 031 322 21 11 Fax: 031 322 37 06 www.admin.ch e-mail: webmaster@admin.ch
DEZA (SDC)	Direktion für Entwicklung und Zusammenarbeit des EDA ⇒ Swiss Agency for Development and Cooperation, DFA	DEZA Eigerstrasse 73 CH-3003 Bern Tel: 031 322 34 75 Fax: 031 324 16 91 www.sdc-gov.ch or www.admin.ch/DEZA
SMA	Schweizerische Meteorlogische Zentralanstalt ⇒ Swiss Meteorological Establishment	SMA Krähbühlstr. 58 CH-8044 Zürich Tel: 01 256 91 11 Fax: 01 256 92 78 www.meteonline.ch e-mail: websupport@sma.ch
BAG (FOPH)	Bundesamt für Gesundheit ⇒ Federal Office for Public Health	BAG Postfach CH-3003 Bern Tel: 031 322 21 11 Fax: 031 324 90 33 www.admin.ch/bag

Annex IV / A. (continued)

BFS	Bundesamt für Statistik ⇒ Federal Statistics Office	BFS Postfach CH-3003 Bern Tel: 031 323 60 11 Fax: 031 323 60 02 www.statistik.admin.ch or www.admin.ch/bfs
BSV	Bundesamt für Sozialversicherungen ⇒ Federal Social Insurance Office	BSV Postfach CH-3003 Bern Tel: 031 322 90 11 Fax: 031 322 78 80 www.admin.ch/BSV
GWF [DHA]	Gruppe für Wissenschaft und Forschung des EDI ⇒ Science and Reserach Group of the DHA	GWF Hallwylstr. 4 CH-3003 Bern Tel: 031 322 68 99 www.admin.ch/gwf e-mail: gwfwebmaster@gwf.admin.ch
BBW	Bundesamt für Bildung und Wissenschaft ⇒ Federal Office for Education and Science	BBW Postfach CH-3003 Bern Tel: 031 322 96 91 www.admin.ch/bbw
BJ	Bundesamt für Justiz ⇒ Federal Office of Justice	BJ Postfach CH-3003 Bern Tel: 031 322 41 43 Fax: 031 322 78 79 www.admin.ch/BJ
EAM	Eidg. Amt für Messwesen ⇒ Federal Office of Metrology	EAM Lindenweg 50 CH-3084 Wabern Tel: 031 323 31 11 Fax: 031 323 32 10 www.eam.ch e-mail: webmaster@eam.admin.ch

Annex IV / A. (continued)

IGE	Eidg. Institut für Geistiges Eigentum ⇒ Federal Institute of Intellectual Property	IGE Einsteinstrasse 2 CH-3003 Bern Tel: 031 325 25 25 Fax: 031 325 25 26 www.ige.ch e-mail: info@ipi.ch
EZV	Eidg. Zollverwaltung ⇒ Federal Customs Administration	EZV Monbijoustrass 40 CH-3003 Bern Tel: 031 322 65 11 Fax: 031 322 78 72 www.admin.ch/EZV www.zoll.admin.ch e-mail: ozd.zentrale@inet.ezv.admin.ch
EAV	Eidg. Alkoholverwaltung ⇒ Federal Alcohol Administration	EAV Länggssstrasse 31 CH-3003 Bern Tel: 031 309 12 11 Fax: 031 301 15 00 www.admin.ch/eav e-mail: info@eav.admin.ch
SECO [formed by fusion of BAWI and BWA]	Staatssekretariat für Wirtschaft ⇒ State Secretariat for Economic Affairs	SECO Bundeshaus Ost CH-3003 Bern Tel: 031 322 56 56 Fax: 031 322 56 00 www.seco-admin.ch e-mail: info@seco.admin.ch
BLW (FOA)	Bundesamt für Landwirtschaft ⇒ Federal Office of Agriculture	BLW Postfach CH-3003 Bern Tel: 031 322 25 11 Fax: 031 322 26 34
BVET	Bundesamt für Veterinärwesen ⇒ Federal Veterinary Office	BVET CH-3097 Liebefeld Tel: 031 323 85 02 Fax: 031 323 85 22 www.admin.ch/bvet

Annex IV / A. (continued)

BBT	Bundesamt für Berufsbildung und Technologie ⇒ Federal Office for Professional Training and Technology	BBT Postfach CH-3003 Bern Tel: 031 322 96 91 www.admin.ch/bbt
BWL	Bundesamt für wirtschaftliche Landesversorgung ⇒ Federal Office for Strategic Supplies	BWL Postfach CH-3003 Bern Tel: 031 322 21 71 Fax: 031 322 20 57 www.admin.ch/bwl
BAV	Bundesamt für Verkehr ⇒ Federal Office for Transport	BAV Bundeshaus Ost CH-3003 Bern Tel: 031 322 57 11 Fax: 031 322 58 11 www.bav.admin.ch
BAZL	Bundesamt für Zivilluftfahrt ⇒ Federal Office for Civil Aviation	BAZL Maulbeerstr. 4 CH-3000 Bern Tel: 031 325 80 39 Fax: 031 325 80 32
BUWAL (SAEFL)	Bundesamt für Umwelt, Wald und Landschaft ⇒ Swiss Agency for the Environment, Forests and Landscape	BUWAL Postfach CH-3003 Bern Tel: 031 322 93 11 Fax: 031 322 99 81 www.admin.ch/buwal
EPZB	Eidg. Parlaments- und Zentralbiibliothek ⇒ Central libary of Parliament and of the Federal Administration	EPZB Bundeshaus West CH-3003 Bern Tel: 031 322 37 89 www.admin.ch/ch/d/bk/epzb
EDMZ	Eidg. Drucksachen- und Materailzentrale ⇒ Federal Publications and Supplies Office	EDMZ CH-3000 Bern Tel: 031 322 39 16 Fax: 031 322 39 75 www.admin.ch/edmz

Annex IV / A. (continued)

	Bibliothek des Bundesamtes für Statistik ⇒ Library of the Federal Statictics Office	Bundesamt für Statistik Schwarztorstrasse 96 CH-3003 Bern Tel: 031 323 60 54
ETHZ	ETH Zürich ⇒ Swiss Federal Institute of Technology Zürich	ETHZ ETH Zentrum CH-8092 Zürich Tel: 01 632 11 11 Fax: 01 632 10 77 www.ethz.ch e-mail: info@ethz.ch
EPFL	EPF Lausanne ⇒ Swiss Federal Institute of Technology Lausanne	EPFL-Ecublens CH-1015 Lausanne Tel: 021 693 11 11 Fax: 021 693 43 80 www.epfl.ch
PSI	Paul Scherrer Institut in Villigen ⇒ Paul Scherrer Institute Villigen	PSI CH-5232 Villigen Tel: 056 310 21 11 Fax: 056 310 21 99 www.psi.ch e-mail: pr@psi.ch
WSL	Eidg. Forschungsanstalt für Wald, Schnee und Landschaft in Birmensdorf ⇒ Swiss Federal Institute for Forest, Snow and Landscape Research	WSL Zürcherstrasse 111 CH-8903 Birmensdorf Tel: 01 739 21 11 Fax: 01 739 22 15 http://www.wsl.ch
WSL	Eidg. Forschungsanstalt für Wald, Schnee und Landschaft in Davos ⇒ Swiss Federal Institute for Forest, Snow and Landscape Research	WSL CH-7260 Davos Dorf Tel: 081 417 01 11 Fax: 081 417 01 10

Annex IV / A. (continued)

EMPA	Eidg. Materialprüfungsanstalten ⇒ Swiss Federal Laboratories for Materials Testing and Research	EMPA Überlandstr. 129 – 133 CH-8600 Dübendorf Tel: 01 823 55 11 Fax: 01 823 62 44 and EMPA Lerchenfeldstr. 5 CH-9014 St. Gallen Tel: 071 274 74 74 Fax: 071 274 74 99 www.empa.ch
EAWAG	Eidg. Anstalt für Wasser-versorgung, Abwasser-reinigung und Gewässerschutz ⇒ Swiss Federal Institute for Environmental Science and Technology	EAWAG Überlandstr. 129 – 133 CH-8600 Dübendorf Tel: 01 823 55 11 Fax: 01 823 50 28 and EAWAG Forschungszentrum für Limnologie CH-6074 Kastanienbaum Tel: 041 349 21 11 Fax: 041 349 21 68 www.eawag.ch
NAZ (=NEOC)	Nationale Alarmzentrale (⇒ National Emergency operations Centre)	NAZ Ackermannstrasse 26 CH-8044 Zürich Tel: 01 256 94 81 Fax: 01 256 94 97 www.naz.ch e-mail: info@naz.ch
RAP	Eidg. Forschungsanstalt für Nutztiere ⇒ Federal Research Institute for Farm Animals	RAP CH-1725 Posieux FR Tel: 021 407 71 11 Fax: 026 407 73 00 www.admin.ch/sar/rap

Annex IV / A. (continued)

FAL	Eigd. Forschungsanstalt für Agrarökologie und Landbau ⇒ Federal Research Institute for Agricultural Ecology and Production	FAL Reckenholzstr. 191/211 CH-8046 Zürich Tel: 01 377 71 11 Fax: 01 377 72 01 www.admin.ch/sar/fal
IUL [section of FAL]	Institut für Umweltschutz und Landwirtschaft ⇒ Institute for Environmental Protection and Agriculture	IUL Postfach CH-3097 Liebefeld
FAT	Eidg. Forschungsanstalt für Agrarwirtschaft und Landtechnik ⇒ Federal Research Institute for Agriculture and Agricultural Technology	FAT CH-8356 Tänikon bei Aadorf Tel: 052 368 31 31 Fax: 052 365 11 90 www.admin.ch/sar/fat
FAM	Eidg .Forschungsanstalt für Milchwirtschaft ⇒ Federal Milk Research Institute	FAM Schwarzenburgstrasse 161 CH-3079 Liebefeld Tel: 031 323 81 66 Fax: 031 323 82 27 www.admin.ch/sar/fam
RAC	Eidg. Forschungsanstalt für Pflanzenbau ⇒ Federal Research Institute for Plant Cultures	RAC CH-1260 Nyon Tel: 022 363 44 44 Fax: 022 362 13 25 www.admin.ch/sar/rac
	Toxikologie Institut der ETH und der Universität Zürich ⇒ Toxicology Institute of ETH and the University Zürich	Institut für Toxikologie der ETH und UNI Zürich CH-8603 Schwerzenbach Tel: 01 825 75 11

Annex IV / A. (continued)

SBB	Schweizerische Bundesbahnen ⇒ Swiss Federal Railways	SBB Hochschulstrasse 6 CH-3030 Bern Tel: 0512 20 11 11 www.sbb.ch e-mail: web.railinfo@sbb.ch
Suva	Schweizerische Unfall-versicherungsanstalt ⇒ Swiss National Accident Insurance Fund	Suva Fluhmattstr. 1 Postfach CH-6002 Luzern Tel: 041 419 51 11 Fax: 041 419 58 28 www.suva.ch
IKS	Interkantonale Kontroll-stelle für Heilmittel ⇒ Intercantonal Office for the Control of Medicines	IKS Erlachstr. 8 CH-3000 Bern 9 Tel: 031 322 02 11 Fax: 031 322 02 12 www.iks.ch

Annex IV / B. Cantonal Offices etc.

- Amt für Abfall, Wasser, Energie und Luft des Kantons Zürich, Walchetor, CH-8090 Zürich
- Amt für Feuer- und Zivilschutz, Schlagstrasse 87, Postfach 762, CH-6430 Schwyz
- Amt für Gewässerschutz und Abfallwirtschaft, Reiterstrasse 11, CH-3011 Bern
- Amt für Gewerbe, Industrie und Berufsbildung, Arbeitsinspektorat, Utengasse 36, Postfach, CH-4005 Basel
- Amt für Industrie, Gewerbe und Handel, Aabachstrasse 5, Postfach, CH-6301 Zug
- Amt für Umwelt des Kantons Thurgau, Bahnhofstrasse 55, CH-8510 Frauenfeld
- Amt für Umweltschutz und Energie des Kantons Basel-Landschaft, Rheinstrasse 29, CH-4410 Liestal
- Amt für Umweltschutz des Kantons Solothurn, Baselstrasse 77, CH-4500 Solothurn
- Amt für Umweltschutz des Kantons Luzern, Klosterstrasse 31, CH-6002 Luzern
- Amt für Umweltschutz des Kantons Obwalden, St. Antonistrasse 4, Postfach 1661, CH-6061 Sarnen
- Amt für Umweltschutz, Verwaltungsgebäude 1, Aabachstrasse 5, Postfach, CH-6301 Zug
- Amt für Umweltschutz des Kantons Nidwalden, Engelbergstrasse 34, Postfach 1240, CH-6371 Stans
- Amt für Umweltschutz des Kantons Schwyz, Schlagstrasse 82, CH-6430 Schwyz
- Amt für Umweltschutz des Kantons Uri, Klausenstrasse 4, CH-6460 Altdorf
- Amt für Umweltschutz des Kantons Graubünden, Neumühle, Gürtelstrasse 89, CH-7001 Chur

- Amt für Umweltschutz des Kantons Glarus, Postgasse 29, CH-8750 Glarus
- Amt für Umweltschutz des Kantons St. Gallen, Linsebühlstrasse 91, CH-9001 St. Gallen
- Amt für Umweltschutz des Kantons Appenzell Innerrhoden, Gaiser Strasse 8, CH-9050 Appenzell
- Amt für Umweltschutz des Kantons Appenzell Ausserrhoden, Kasernenstrasse 17, CH-9102 Herisau
- Amt für Wasserwirtschaft des Kantons Solothurn, Rötihof, CH-4500 Solothurn
- Arbeitsinspektorat des Kantons Glarus, Hauptstrasse 8, CH-8750 Glarus
- Arbeitsinspektorat Obwalden, St. Antonistrasse 4, Postfach 172, CH-6061 Sarnen
- Chemisches Laboratorium für Lebensmittelkontrolle und Umweltschutz Graubünden, Planaterrastrasse 11, CH-7001 Chur
- Département de l'industrie du commerce et de l'artisanat, Inspection du travail, Rue Joseph-Piller 13, CH-1700 Fribourg
- Dipartimento del territorio TI, Divisione dell'ambiente, Via S. Franscini 17, CH-6501 Bellinzona
- Direction générale de l'environnement, Rue de l'Hôtel-de-Ville 2, Case postale 3918, CH-1211 Genève 3
- Gesundheits- und Fürsorgedirektion, Kantonsarztamt, Rathausgasse 1, CH-3000 Bern 9
- Gewässerschutzamt, Basel-Stadt, Hochbergerstrasse 158, CH-4019 Basel
- Industrie- und Gewerbe-Inspektorat des Kantons Thurgau, Verwaltungsgebäude, Promenade, CH-8510 Frauenfeld
- Industrie-, Gewerbe- und Arbeitsamt des Kt. Aargau, Sektion Arbeitnehmerschutz, Bahnhofstrasse 86, CH-5001 Aarau
- Kantonales Amt für Industrie, Gewerbe und Arbeit, Abteilung Arbeitnehmerschutz, Laupenstrasse 22, CH-3011 Bern

- Kantonales Amt für Industrie, Gewerbe und Arbeit Baselland, Bahnhofstrasse 32, CH-4133 Pratteln 1
- Kantonales Amt für Industrie, Gewerbe und Handel, Bundesplatz 14, CH-6002 Luzern
- Kantonales Amt für Industrie, Gewerbe und Arbeit, Rathausplatz 5, CH-6460 Altdorf UR
- Kantonales Amt für Industrie, Gewerbe und Arbeit, Arbeitsinspektorat, Nansenstrasse 16, CH-8090 Zürich
- Kantonales Amt für Industrie, Gewerbe und Arbeit (KIGA), Abteilung Arbeitsinspektorat, Moosbruggstrasse 11, CH-9001 St. Gallen
- Kantonales Arbeitsinspektorat, Untere Sternengasse 2, Postfach 16, CH-4504 Solothurn
- Kantonales Arbeitsinspektorat, Bahnhofstrasse 15, CH-6430 Schwyz
- Kantonales Arbeitsinspektorat, Graubünden, Grabenstrasse 8, CH-7001 Chur
- Kantonales Arbeitsinspektorat, Schaffhausen, Mühlentalstrasse 105, Postfach KIGA 687, CH-8201 Schaffhausen
- Kantonales Arbeitsinspektorat, Appenzell I. Rh., Landeskanzlei, CH-9050 Appenzell
- Kantonales Arbeitsinspektorat, Appenzell A. Rh., Regierungsgebäude, CH-9102 Herisau 2
- Kantonales Industrie-, Gewerbe- und Arbeitsamt, Engelbergstrasse 34, Postfach, CH-6371 Stans
- Kantonales Laboratorium, Basel-Stadt, Kannenfeldstrasse 2, Postfach, CH-4012 Basel
- Kantonales Laboratorium, für Lebensmittelkontrolle und Umweltschutz, Postfach 786, CH-8201 Schaffhausen
- Kantonales Laboratorium, Thurgau, Spannerstrasse 20, CH-8510 Frauenfeld
- Kantonales Laboratorium Aargau, Kunsthausweg 24, CH-5000 Aarau

- Kantonales Laboratorium Bern, Muesmattstrasse 19, Postfach, CH-3000 Bern 9
- Kantonales Laboratorium Luzern, Vonmattstrasse 16, Postfach, CH-6002 Luzern
- Kantonales Laboratorium Zug, Zugerstrasse 50, Postfach 262, CH-6312 Steinhausen
- Kantonales Laboratorium Zürich, Fehrenstrasse 15, Postfach, CH-8030 Zürich
- Koordinationsstelle für, Umweltschutz des Kantons Bern, Reiterstrasse 11, CH-3011 Bern
- Koordinationsstelle für Umweltschutz des Kantons Basel-Stadt, Münsterplatz 14, CH-4051 Basel
- Koordinationsstelle für Störfallvorsorge des Kantons Zürich, Birmensdorferstrasse 55, CH-8090 Zürich
- Koordinationsstelle für Umweltschutz, Kaspar-Escher-Haus, Stampfenbachstrasse 19, CH-8090 Zürich
- Koordinationsstelle für Umweltschutz des Kantons Schaffhausen, Beckenstube 9, Rathaus, CH-8201 Schaffhausen
- Laboratoire cantonal du canton de Fribourg, Chemin du Musée 15, CH-1700 Fribourg
- Laboratoire cantonal de Neuchâtel, Rue Jehanne-de-Hochberg 5, Case postale, CH-2001 Neuchâtel
- Laboratoire cantonal des eaux, du canton de Jura, Champs-Fallat, CH-2882 St-Ursanne
- Laboratoire cantonal du canton de Valais, Rue Pré-d'Amédée 2, CH-1950 Sion
- Laboratoire cantonal du canton du Jura, Faubourg des Capucins 20, Case postale 2345, CH-2800 Delémont 2
- Laboratorium der Urkantone, Föhneneichstrasse 15, Postfach 363, CH-6440 Brunnen
- Office cantonal de l'inspection et des relations du travail, Rue Ferdinand-Hodler 23, Case postale, CH-1211 Genève 3

- Office cantonal de l'industrie, des arts et métiers et du travail, Rue Neuve 8, Case postale 1183, CH-2502 Bienne
- Office de la protection de l'environnement, Route de la Fonderie 2, CH-1700 Fribourg
- Office des eaux et de la protection de la nature, Les Champs Fallat, CH-2882 St-Ursanne
- Service cantonal de la protection de l'environnement, Rue du Tombet 24, Case postale 145, CH-2034 Peseux
- Service de l'environnement et de l'énergie du canton de Vaud, Les Croisettes, Case postale 33, CH-1066 Epalinges
- Service de l'inspection et de la santé au travail, Rue de l'Ecluse 65, Case postale, CH-2001 Neuchâtel
- Service de la protection de l'environnement, Rue des Creusets 5, CH-1950 Sion
- Service des arts et métiers et du travail, Rue du 24-Septembre 1, CH-2800 Delémont 1
- Service des eaux, sols et assainissement, Rue du Valentin 10, CH-1014 Lausanne
- Service du pharmacien cantonal, Avenue Beau-Séjour 24, CH-1206 Genève
- Service social de protection des travailleurs et des relations du travail, Place du Midi 64, Case postale, CH-1951 Sion
- Sezione protezione, aria e acqua, Via Salvioni 2, CH-6501 Bellinzona
- Sicherheitsinspektorat, Basel-Landschaft, Rheinstrasse 29, CH-4410 Liestal
- Ufficio dell'ispettorato del lavoro, Residenza Governativa, CH-6501 Bellinzona

Annex IV / C. Faculties etc.

- Departement Umweltnaturwissenschaften, ETH-Hönggerberg, CH-8093 Zürich
- Ecole polytechnique fédérale de Lausanne, Rectorat, CH-1015 Lausanne
- Eidgenössische Technische Hochschule Zürich, Rektorat, ETH-Zentrum, CH-8092 Zürich
- Hochschule St. Gallen, Rektorat, Dufourstrasse 50, CH-9000 St. Gallen
- Institut du génie de l'environnement (IGE), Ecublens, CH-1015 Lausanne
- Institut für Hygiene und Arbeitsphysiologie, ETH-Zentrum, CH-8092 Zürich
- Institut für Sozial- und Präventivmedizin der Universität Bern, Hochschulstrasse 4, CH-3012 Bern
- Institut für Sozial- und Präventivmedizin der Universität Zürich, Sumatrastrasse 30, CH-8006 Zürich
- Institut für Toxikologie, Schorenstrasse 16, CH-8603 Schwerzenbach
- Institut Universitaire Romand de santé au travail, Rue du Bugnon 19, CH-1001 Lausanne
- Paul Scherrer Institut, Postfach, CH-5232 Villigen PSI
- Universität Basel, Rektorat, , , Petersplatz 1, CH-4051 Basel
- Universität Basel, Phil.-nat. Fakultät, Dekanat, Missionsstrasse 64, CH-4055 Basel

- Universität Basel, Medizinische Fakultät, Dekanat, Hebelstrasse 25, CH-4056 Basel
- Universität Bern, Medizinische Fakultät, Dekanat, Murtenstrasse 11, CH-3008 Bern
- Universität Bern, Pharmakologisches Institut, Friedbühlstrasse 49, CH-3010 Bern
- Universität Bern, Rektorat, Hochschulstrasse 4, CH-3012 Bern
- Universität Zürich, Rektorat, Universität Zürich-Zentrum, Rämistrasse 71, CH-8006 Zürich
- Universität Zürich, Philosophische Fakultät II, Dekanat, Winterthurerstrasse 190, CH-8057 Zürich
- Université de Fribourg, Faculté des sciences, Rue Albert-Gockel 3, CH-1700 Fribourg
- Université de Fribourg, Rectorat, CH-1700 Fribourg
- Université de Genève, Rectorat, Rue Général-Dufour 2, CH-1204 Genève
- Université de Genève, Faculté des sciences, Décanat, Quai Ernest-Ansermet 30, CH-1205 Genève
- Université de Lausanne, Rectorat, CH-1000 Lausanne
- Université de Lausanne, Faculté de médecine, Décanat, Rue du Bugnon 9, CH-1005 Lausanne
- Université de Neuchâtel, Rectorat, Avenue du Premier-Mars 26, CH-2000 Neuchâtel
- Université de Neuchâtel, Faculté des sciences, Chemin de Chantemerle 20, CH-2000 Neuchâtel

Annex IV / D. Diverse Organizations

- Arbeitgeberverband der schweizerischen Textilveredelungs-Industrie, Beethovenstrasse 20, CH-8002 Zürich
- Arbeitgeberverband der Schweizer Maschinenindustrie, Kirchenweg 4, Postfach, CH-8032 Zürich
- Ärztinnen und Ärzte für Umweltschutz, Postfach 41, CH-4013 Basel
- Association des Groupements et Organisations Romands de l'Agriculture (AGORA), Avenue des Jordils 3, Case postale, CH-1000 Lausanne 6
- Association des Ingénieurs Agronomes de la Suisse Romande, Route de la Daille, CH-1740 Neyruz FR
- Association Internationale des Postgradués en Environnement de l'EPFL, Case postale 69, CH-1015 Lausanne
- Association romande pour la protection des eaux + de l'air, ARPEA, Chemin des Graviers 6, CH-2016 Cortaillod
- Associazione Consumatrici della Svizzera Italiana, Via Lambertenghi 4, CH-6900 Lugano
- Assoziation der Schweizerischen Aerosolindustrie, Bahnhofstrasse 37, CH-8023 Zürich 1
- Beratungsstelle für Unfallverhütung in der Landwirtschaft, Hügelistrasse 3, CH-5040 Schöftland
- Bernisches Institut für Arbeitsmedizin, Konsumstrasse 16b, CH-3007 Bern
- Christlich-Nationaler Gewerkschaftsbund der Schweiz, Postfach 2630, CH-3001 Bern
- Eidg. Koordinationskommission für Arbeitssicherheit, Sekretariat, Fluhmattstrasse 1, CH-6002 Luzern
- Eidgenössische Fachkommission für biologische Sicherheit, Sekretariat, c/o BUWAL, CH-3003 Bern

- Fachverband Elektroapparate für Haushalt und Gewerbe, Schweiz, Obstgartenstrasse 28, Postfach 190, CH-8035 Zürich
- Fachverband Schweizerischer Hersteller von Betonzusatzmitteln, Postfach, CH-8048 Zürich
- Fédération interprofessionelle des salariés, Place Riponne 1, Case postale, CH-1000 Lausanne 17
- Fédération romande des consommateurs, Rue de Genève 7, Case postale 2820, CH-1002 Lausanne
- Fédération romande des syndicats patronaux, Rue de St.-Jean 98, CH-1211 Genève
- Föderativverband des Personals öffentlicher Verwaltungen und Betriebe, Postfach, CH-3000 Bern 23
- Forschungsinstitut für biologischen Landbau, Ackerstrasse, Postfach, CH-5070 Frick
- Generaldirektion SBB, Hochschulstrasse 6, CH-3000 Bern 30
- Gesellschaft Schweizerischer Privater Dienstleistungslaboratorien, Elfenstrasse 19, Postfach, CH-3000 Bern 16
- Gesellschaft zur Förderung der schweiz. Wirtschaft, Postfach, CH-8034 Zürich
- Greenpeace Schweiz, Heinrichstrasse 147, Postfach, CH-8031 Zürich
- Groupement des Firmes de Suisse romande et du Tessin, distribuant du matériel, de lutte contre le feu, Case postale 229, CH-1211 Genève 26
- Industriegaseverband Schweiz, Bahnhofstrasse 37, Postfach, CH-8023 Zürich
- Interessengemeinschaft der Fabrikanten von Handfeuerlöschern, Stettbachstrasse 8-10, CH-8600 Dübendorf 1
- Interessengemeinschaft der Schweizerischen Vertriebsfirmen und Herstellern von Handfeuerlöschern, Postfach 740, CH-2501 Biel/Bienne

- Interpharma, Lichtstrasse 35, CH-4056 Basel
- Konsumentinnenforum Schweiz, KF, Grossmannstr. 29, Postfach 294 , CH-8037 Zürich
- Kontaktstelle der Schweizerischen Umweltorganisationen in Bern, Monbijoustrasse 29, Postfach 7015, CH-3001 Bern
- Kunststoff-Verband Schweiz, Schachenallee 29, CH-5000 Aarau
- Landesverband freier Schweiz. Arbeitnehmer, Badenerstrasse 41, CH-8004 Zürich
- Naturfreunde Schweiz, Pavillonweg 3, Postfach 7364, CH-3001 Bern
- Pro Natura, Wartenbergstrasse 22, Postfach, CH-4020 Basel
- Schweiz. Gemeindeverband, Solothurnstrasse 22, CH-3322 Schönbühl
- Schweiz. Gesellschaft für Prävention und Gesundheitswesen, Effingerstrasse 40, Postfach 8172, CH-3001 Bern
- Schweiz. Gewerbeverband, Schwarztorstrasse 26, Postfach 2721, CH-3001 Bern
- Schweiz. Gewerkschaftsbund, Monbijoustrasse 61, CH-3007 Bern
- Schweiz. Nutzfahrzeugverband, ASTAG, Weissenbühlweg 3, CH-3007 Bern
- Schweiz. Städteverband, Florastr. 13, CH-3000 Bern 6
- Schweiz. Technischer Verband, Weinbergstrasse 41, Postfach, CH-8023 Zürich
- Schweiz. Toxikologisches Informationszentrum, Klosbachstrasse 107, CH-8030 Zürich
- Schweiz. Verein für technische Inspektionen, Richtistrasse 15, CH-8304 Wallisellen

- Schweiz. Vereinigung für Gesundheits- und Umwelttechnik, Postfach, CH-8010 Zürich
- Schweizerische Akademie der technischen Wissenschaften, Postfach, CH-8039 Zürich
- Schweizerische Akademie der Naturwissenschaften, SANW, Bärenplatz 2, CH-3011 Bern
- Schweizerische Akademie der medizinischen Wissenschaften, Petersplatz 13, CH-4051 Basel
- Schweizerische Bau-, Planungs- und Umweltschutzdirektoren-Konferenz, Gsteigstrasse 52, Postfach 3249, CH-8049 Zürich
- Schweizerische Beratungsstelle für Unfallverhütung, Laupenstrasse 11, Postfach 8236, CH-3001 Bern
- Schweizerische Gesellschaft für Pharmakologie und Toxikologie, Université de Lausanne, Case postale, CH-1015 Lausanne
- Schweizerische Gesellschaft für Biochemie, Advanced C&D, CSEM, Jaquet Droz 1, CH-2007 Neuchâtel 7
- Schweizerische Gesellschaft für Sozial- und Präventivmedizin, Steinengraben 49, CH-4051 Basel
- Schweizerische Gesellschaft für Umweltschutz, Merkurstrasse 45, Postfach 124 A, CH-8032 Zürich
- Schweizerische Gesellschaft für Chemische Industrie, Nordstrasse 15, Postfach 328, CH-8035 Zürich
- Schweizerische Interessengemeinschaft der Abfallbeseitigungsorganisation, Wildbachstrasse 2, CH-8340 Hinwil
- Schweizerische Normen-Vereinigung, Mühlebachstrasse 54, CH-8008 Zürich
- Schweizerische Unfallversicherungsanstalt, Fluhmattstrasse 1, CH-6002 Luzern
- Schweizerische Vereinigung zum Schutz der kleinen und mittleren Bauern, Schützengässchen 5, Postfach, CH-3001 Bern
- Schweizerische Vereinigung für Landesplanung, Seilerstrasse 22, CH-3011 Bern

- Schweizerische Vereinigung unabhängiger Sicherheitsingenieure und -berater, Güstrasse 46, CH-8700 Küsnacht ZH
- Schweizerische Zentrale für Handelsförderung, Euro Center Schweiz, Stampfenbachstrasse 85, Postfach, CH-8035 Zürich
- Schweizerischer Polyurethan-Verband, Schachenallee 29, CH-5000 Aarau
- Schweizerischer Arbeitgeberverband, Florastrasse 44, Postfach, CH-8034 Zürich
- Schweizerischer Bauernverband, Laurstrasse 10, CH-5200 Brugg
- Schweizerischer Bund, für Naturschutz, Wartenbergstrasse 22, CH-4052 Basel (**new: Pro Natura**)
- Schweizerischer Chemikanten- und Cheministen-Verband SCV, Postfach 426, CH-4005 Basel
- Schweizerischer Drogistenverband, Postfach 924, CH-2501 Biel
- Schweizerischer Elektrotechnischer Verein (SEV), Luppmenstrasse 1, CH-8320 Fehraltorf
- Schweizerischer Feuerwehrverband, Ensingerstrasse 37, Postfach, CH-3000 Bern 16
- Schweizerischer Gewerkschaftsbund, Monbijoustrasse 61, Postfach 64, CH-3000 Bern 23
- Schweizerischer Handels- und Industrieverein, Vorort, Hegibachstrasse 47, Postfach 1072, CH-8032 Zürich
- Schweizerischer Ingenieur- und Architekten-Verein, Postfach, CH-8039 Zürich
- Schweizerischer Nationalfonds zur Förderung der wissenschaftlichen Forschung, Wildhainweg 20, CH-3001 Bern
- Schweizerischer Städteverband, Florastrasse 13, CH-3000 Bern 6
- Schweizerischer Verband der Umweltfachleute, Brunngasse 60, CH-3011 Bern

- Schweizerischer Verband für Materialwirtschaft und Einkauf, Laurenzenvorstadt 90, CH-5001 Aarau
- Schweizerischer Verein für Kältetechnik, ETH-Zentrum, Sonneggstrasse 3, CH-8092 Zürich
- Schweizerisches Institut zur Förderung der Sicherheit, Nüschelerstrasse 45, CH-8001 Zürich
- Société pour la Protection de l'Environnement, Secrétariat romand (SPE), Rue Saint-Ours 6, CH-1205 Genève
- Société suisse de médecine du travail, c/o CNA, Case postale 287, CH-1001 Lausanne
- Stiftung für Konsumentenschutz, (SKS), Monbijoustrasse 61, CH-3007 Bern
- Swiss Professional Association of Quality Assurance, P.O. Box 444, CH-4021 Basel 21
- Textilverband Schweiz, Beethovenstrasse 20, Postfach 4838, CH-8022 Zürich
- Treuhandstelle der Schweizerischen Seifen- und Waschmittelimporteure, Belpstrasse 23, Postfach 5032, CH-3001 Bern
- Verband der Schweizerischen Seifen- und Waschmittelindustrie, Breitingerstrasse 35, Postfach, CH-8027 Zürich
- Verband Galvanobetriebe der Schweiz, Wartenbergstrasse 47, CH-4052 Basel
- Verband Schweizerischer Unfallverhütungsfirmen, Haus des Gewerbes, Altmarkt Strasse 96, CH-4410 Liestal
- Verband Schweizerischer Lack- und Farbenfabrikanten, Badenerstrasse 701, CH-8048 Zürich
- Verband Textilreiniger Schweiz, Schwarztorstrasse 26, Postfach 6922, CH-3001 Bern
- Verbindung der Schweizer Aerzte, Postfach, CH-3000 Bern 16
- Verein Schweizerischer Metallwarenfabrikanten, Gartenstrasse 3, CH-6300 Zug

- Verein Schweizerischer Maschinen-Industrieller, Kirchenweg 4, Postfach, CH-8032 Zürich
- Vereinigung des Schweizerischen Import- und Grosshandels, Postfach 656, CH-4010 Basel
- Vereinigung für Landesplanung, Seilerstrasse 22, CH-3011 Bern
- Vereinigung für Umweltrecht, Postfach, CH-8026 Zürich
- Vereinigung Kantonaler Feuerversicherungen, Bundesgasse 20, Postfach, CH-3001 Bern
- Vereinigung Schweiz. Angestelltenverbände, Badenerstrasse 332, CH-8004 Zürich
- Vereinigung Schweizerischer Druckfarbenfabrikanten, Badenerstrasse 701, CH-8048 Zürich
- Vereinigung Schweizerischer Hersteller von Sicherheitsanlagen, Alte Landstrasse 411, CH-8708 Männedorf
- VLG Schweizerische Vereinigung für Gewässerschutz und Luft - Hottingerstrasse 4, Postfach , CH-8024 Zürich
- World Wildlife Fund Schweiz, Hohlstrasse 110, Postfach, CH-8010 Zürich-Mülligen
- Zentralverband Schweiz. Arbeitgeberorganisationen, Florastr. 44, Postfach 504, CH-8034 Zürich