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PART II

Chapter 4

Chemicals management

Austria has adopted a proactive approach to chemicals policy, both domestically and within the EU. This chapter examines Austria's policy and institutional framework for managing the risks associated with chemicals. It assesses the measures taken to implement the EU chemicals legislation, in particular the Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). The chapter provides an overview of the occurrence of some hazardous substance categories in human bodies and the environment, based on a range of monitoring programmes. Finally, Austria's endeavours to promote "green chemistry" and chemicals leasing are discussed.

Assessment and recommendations

Austria's management of the risks associated with chemicals takes place mainly in the framework of EU legislation and policies. It has generally been a proactive participant in the development of EU policy, and pioneered some initiatives that were adopted at EU level, e.g. the regulation of volatile organic compounds, fluorinated greenhouse gases and heavy metals. Most recently, Austria has been at the forefront of efforts to analyse and promote debate about managing the potential health and environmental risks associated with nanomaterials.

In 2007, the EU Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) took effect and significantly altered the framework for chemicals management in Austria and the European Union. EU regulations on classification, labelling and packaging (CLP) and on biocidal products have also been significantly changed in recent years. REACH has fundamentally redefined chemicals management by shifting the burden of proof for the safety of chemicals from government to industry. Austria and other EU countries, together with the European Chemicals Agency, must now ensure that industry generates sufficient information on the health and environmental effects of chemicals and, when appropriate, require authorisation or restrictions on the use of specific chemicals.

While REACH will generate more information about chemical hazards, its implementation is still at an early stage and will involve much learning by doing. Monitoring the presence of chemicals in humans and the environment is one source of information about potential hazards but, even when such data are available, extrapolating health and environmental impacts is very difficult. Austria has launched many initiatives to identify priority chemicals, but the human and financial resources are very limited in relation to the objectives to be achieved. Continued efforts are, therefore, needed to enhance the efficiency and effectiveness of current initiatives. Steps that could be taken include developing performance indicators that can guide risk reduction activities and help monitor progress; seeking efficiency gains, e.g. by better integrating activities related to biocides and plant protection products; and linking scientific and monitoring programmes more closely with decision making regarding risk reduction.

The development and implementation of chemicals legislation enjoys broad support within the Austrian government and with the main stakeholders. Horizontal and vertical inter-institutional co-operation is smooth and the division of duties is clear. Building on a long-established tradition, co-operation between industry and government is particularly strong. Several forums and platforms have been established to facilitate dialogue. Government and industry work closely in supporting the REACH Helpdesk, and have jointly developed guidance documents. The development of the Nanotechnology Action Plan was based on close co-operation between industry and government, as well as with other stakeholders. However, meeting the requirements of REACH will be a major challenge for chemical companies, especially small and medium-sized enterprises (SMEs). More could

be done to target support to SMEs, particularly those that produce or use very hazardous chemicals, and to further streamline administrative requirements.

EU countries must prepare dossiers for chemical substances that might be considered candidates for authorisation. Those confirmed can only be marketed subject to the terms of the authorisation. Inclusion on the candidate list triggers obligations on industry to provide further information. Austria has been one of the most active countries in identifying candidate chemicals for authorisation; since 2008, it has prepared dossiers on nine substances, and it set the objective of nominating two to three substances a year for inclusion on the candidate list. To identify candidate chemicals, it uses a risk-based approach, drawing on monitoring data. The approach adopted seems well founded and could serve as a model for other countries.

Enforcement of REACH and the CLP in Austria rests with the nine *Länder*. There are a total of about 25 chemicals inspectors, whose responsibilities have increased with the implementation of REACH. Training, planning, provision of guidance and co-ordination appear to be well organised. Co-operation with health and safety inspectors has been established, and co-operation with inspectors responsible for water management is to start in 2013. This kind of arrangement could be usefully extended to other environment- and chemicals-related areas. In addition, further efforts could be made to develop indicators linking the performance of inspectors with the reduction of chemicals-related risks. More stringent penalties for non-compliance may need to be applied as experience with REACH develops; currently enforcement actions are generally limited to requests to comply with requirements.

Austria established a pollutant release and transfer register (PRTR) in 2007, one of the last EU countries to do so. The PRTR now meets or exceeds all EU reporting requirements. There is some evidence that it has provided support at the policy level, but more could be done to enhance its transparency and user-friendliness and to make it more accessible to the public.

A 2008 assessment of Seveso Directive implementation concluded that while the provision of information by industry to the public on preparedness for, and response to, major accidents had improved significantly, along with overall safety levels, operators and public authorities should be more proactive. The land-use planning implications of major accident hazards should also be taken into account in the regulatory process, though this is complicated by jurisdictional issues.

One objective of REACH is to enhance the competitiveness of the EU chemicals industry, in particular by providing better incentives to develop safer alternatives to hazardous chemicals. Austria has supported this goal by establishing platforms for the exchange of information among stakeholders on "green chemistry" and on substitutes for hazardous chemicals. Together with Germany and the EU, Austria developed these platforms into a portal providing a worldwide overview of chemicals substitution. Austria has also pioneered chemicals leasing, in which suppliers provide chemicals for certain functions, but retain ownership and take them back when end users no longer need them. Studies suggest that wider use of chemicals leasing could yield significant economic and environmental benefits. Further analysis should be conducted to examine the obstacles to achieving this potential and how they could be overcome.

Recommendations

- Continue to play an active and leadership role in the implementation of REACH and in the work of the European Chemicals Agency.
- Consider how the overall efficiency and effectiveness of chemicals management could be enhanced, for example by developing performance indicators to help guide and monitor the implementation of chemicals control measures and by linking scientific and monitoring programmes more closely with decision making regarding risk reduction.
- Develop a coherent, integrated approach to chemicals and waste management; strengthen co-operation between the programmes on biocide and plant protection products, e.g. in the fields of hazard assessment, authorisation procedures and occupational exposure.
- Strengthen capacity for promoting compliance with chemicals legislation in the *Länder*; strengthen co-operation among inspection bodies in areas such as chemicals, consumer and worker protection, waste, chemical installations, and land-use planning; develop an enforcement strategy to achieve compliance of biocidal products with the EU Biocides Directive.
- Provide more targeted support to SMEs for compliance with REACH requirements, particularly for companies that produce or use very hazardous chemicals.
- Facilitate greater public access to, and use of, the PRTR by improving its transparency and user-friendliness.
- Assess the implementation of the Nanotechnology Action Plan and specify additional measures that may be needed to achieve its objectives.
- Continue to promote chemicals leasing and examine the barriers to its wider application.

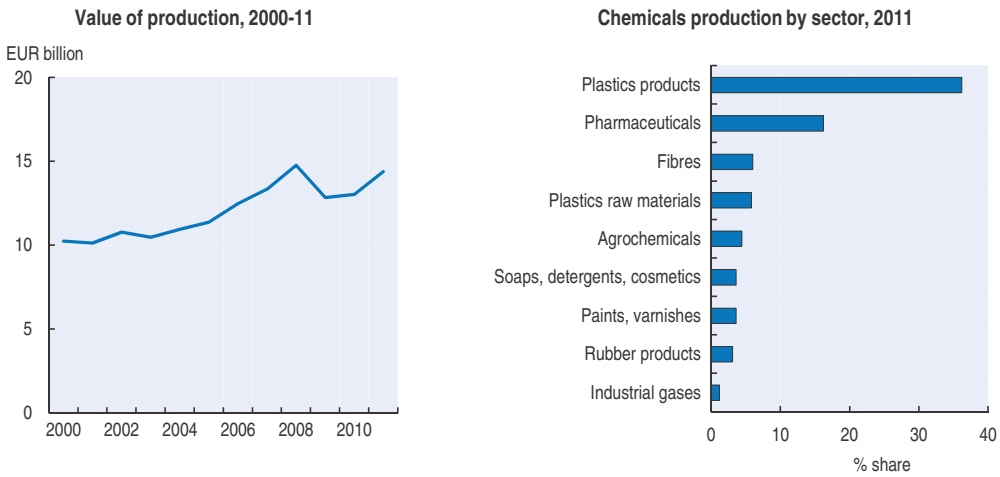
1. The chemicals industry in Austria

The chemicals industry is the second largest industrial sector in Austria, representing about 10% of industrial production value and 12% of value added in 2011 (ABA, 2011). In 2011, the sector accounted for about 10% of total Austrian industrial employment, 13.5% of R&D expenditure and 17% of industrial spending on environmental protection.

In 2011, the value of chemicals production was EUR 14.4 million, a 10.5% increase over 2010, evidence of a recovery following the global financial crisis (Figure 4.1). In the past decade, the sector's output has grown by 42% overall. More than two-thirds of the chemicals produced in Austria are exported.[1] The value of both import and export of chemicals has grown over the past seven years.[2] In 2011, 85% of imports originated in European countries and almost 83% of exports were sold to countries in the same region. Many Austrian chemical companies have foreign subsidiaries or act as headquarters in central and Eastern Europe for multinational chemical companies. Activities in the newer EU countries are an important factor in the recent growth of the Austrian chemicals industry.[3]

The chemicals sector comprised 273 companies in 2011 (down from 349 in 2001) and employed nearly 44 000 people, about 400 more than 10 years before. It is made up of primarily mid-sized companies employing, on average, about 145 people; only 17 companies have more than 500 employees. Chemicals companies are distributed across Austria, with key clusters in Upper Austria near Linz and in the Vienna region.

Figure 4.1. **Chemicals production**



Source: Association of the Austrian Chemical Industry (FCIO), 2012.

StatLink http://dx.doi.org/10.1787/888932895254

Plastics (raw materials and products) made up more than 40% of the value of chemicals production in 2011, followed by pharmaceuticals (16.2%). Agrochemicals represented 4.4% (Figure 4.1). Over the last ten years, investment in the chemicals industry has varied widely, with both positive and negative swings. It peaked in 2007, before the global economic crisis, but today is still 11% higher than it was ten years ago (WIFO, 2012).

2. Policy-making framework

Although Austria did not join the European Union until 1995, it had already adapted its chemicals legislation to EU requirements. In some cases, bans and restrictions on hazardous substances in Austria, e.g. on ozone-depleting substances and volatile organic compounds, were more stringent than those then in effect in the EU (Box 4.1). At the beginning of the 2000s, Austria's management of chemicals took place in the framework of various EU directives dating from the 1970s, such as the Dangerous Substance Directive

Box 4.1. **Austria's example in restricting volatile organic compounds**

Volatile organic compounds (VOCs) are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors. VOCs are emitted by thousands of products, including paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and crafts materials such as glues and adhesives, permanent markers, and photographic solutions.

In 1995, Austria was the first EU country to restrict VOCs, thus providing a risk management model for EU-wide VOCs regulation. Directive 1999/13/EC regulates emissions of VOCs due to the use of organic solvents in certain activities and installations (VOC Solvents Emissions Directive). Today, to comply with EU legislation, Austria annually monitors 150 to 200 product samples from paints and varnishes for VOCs.

(1967/548/EEC), the Dangerous Preparations Directive (1999/45/EC) and the Existing Substances Regulation (1993/793/EEC). Austria established its own national system for registration of substances, and set control and enforcement measures to ensure the functioning of the system.

2.1. Key EU regulations on chemicals and biocides

During the 2000s, the European Union concluded that the legislative framework on chemicals was insufficient to protect human health and the environment from chemicals (Box 4.2). Following lengthy negotiations, the Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) was adopted; it came into force on 1 June 2007. Together with the Regulation on Classification, Labelling and Packaging of substances and mixtures (CLP) and the Biocidal Products Regulation (BPR), REACH provides the essential framework for management of the health and environmental risks associated with chemicals.[4] The recently amended Federal Chemicals Act transposes the main elements of EU chemicals policies into Austrian law, specifying that the Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) is the leading co-ordinating authority in this policy area (Section 3).[5]

Box 4.2. **How the new EU chemicals policy developed**

Before REACH, the EU legislative framework on chemicals had evolved piecemeal over time and was a patchwork of directives and regulations. By the early 2000s, EU countries had concluded that it did not provide a sufficient basis for protecting people and the environment from the potentially adverse effects of chemicals.

The old system distinguished between "new" and "existing" chemicals, with a cut-off date of 1981. Chemicals marketed after that – new chemicals – had to be reported to the authorities, and those produced in quantities above 10 kg per year were subject to test requirements. There were no requirements on the 100 000 or so existing chemicals, those on the market before 1981. Although some data on the properties of existing chemicals were available, they were considered insufficient for adequate assessment and control of the substances. Among other things, this discouraged research and innovation in new chemicals in favour of further development of existing ones.

Public authorities rather than companies were responsible for risk assessment of substances. Risk assessment was comprehensive rather than targeted and use specific, and relatively few existing chemicals were subject to it. As a result, there were very few restrictions on the marketing and use of chemical substances on the grounds of health or environmental protection, and the process for imposing such restrictions was slow.

Only manufacturers and importers, moreover, were required to provide safety information about chemicals; downstream users, such as industrial users and formulators, were generally not subject to the same obligation. Thus information on whether downstream uses were appropriate was scarce.

Source: EC (2007).

The objective of REACH is to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemicals industry. It also promotes alternative methods of hazard assessment in order to reduce testing on animals.

REACH shifted the burden of proof regarding the safety of chemicals from government to companies under the "no data, no market" principle. To comply with the regulation, companies must identify and manage the risks linked to the substances they manufacture and market in the EU. They have to demonstrate how the substance can be safely used, and they must communicate risk management measures to users. If the risks cannot be managed, authorities can restrict the use of substances in various ways. In the long run, the most hazardous substances should be replaced by less dangerous ones (Box 4.3).

Box 4.3. **The REACH process**

REACH establishes procedures for collecting and assessing information on chemicals' properties and hazards. Companies need to register substances, working together with other companies that are registering the same substance. Companies must provide information on the physicochemical, health and environmental properties of substances with a view to determining how substances can be used safely.

The European Chemicals Agency (ECHA) receives registrations and evaluates their compliance; individual countries evaluate selected substances to clarify any initial concerns for human health or the environment. Evaluation under REACH focuses on three areas: examination of testing proposals submitted by registrants, compliance checking of the dossiers submitted and evaluation of substances. ECHA evaluates each dossier to assess the testing proposals, checking whether the dossier complies with requirements. ECHA also co-ordinates substance evaluation, which countries carry out to investigate chemicals of concern in more depth.

The authorisation procedure aims to make sure that the risks from substances of very high concern (SVHCs) are properly controlled and that these substances are progressively replaced by suitable alternatives while ensuring the good functioning of the EU internal market. Substances with certain hazardous properties (e.g. carcinogens) may be identified as SVHCs. After a two-step regulatory process, SVHCs may be included in the candidate list of substances requiring authorisation, meaning they cannot be placed on the market or used unless authorisation is granted for a specific use, or the use is exempted from authorisation. Companies applying for authorisation have to demonstrate that the risk associated with use of the substance is adequately controlled or that the socio-economic benefit of the use outweighs the risk.

A further step is restriction, a tool to protect human health and the environment from unacceptable risks posed by chemicals. Restrictions may limit or ban the manufacture, marketing or use of a substance. They can apply to the substance on its own, or in mixtures or articles even if those do not require registration. It can also apply to imports. An individual country – or ECHA, on request of the European Commission – can propose restrictions if it finds that the risk associated with a substance need to be addressed on an EU-wide basis.

Source: ECHA (2013).

Since this legislation has only been in force for five years and is being implemented in stages, it is not yet possible to assess the efficiency and effectiveness of its implementation. The benefits of the REACH system are expected to manifest themselves gradually, as more and more substances are subject to its requirements. The regulation imposes 2010, 2013 and 2018 deadlines for registration by industry, based on tonnage and classification of substances.

EU countries are also required to implement the CLP Regulation, which entered into force in 2009 and has a transition period running until 2015. The CLP requires industry to classify and label chemicals so as to clearly communicate hazards they present to workers and consumers in the European Union. Before placing chemical substances and mixtures on the market, industry must establish their potential risks to human health and the environment, classifying them according to the hazards identified. Hazardous chemicals also have to be labelled according to a standardised system so that workers and consumers know about their effects before they handle them. The hazards are communicated through standard statements and pictograms on labels and safety data sheets. The CLP, which is based on the United Nations Globally Harmonised System, replaces two previous pieces of legislation.

The BPR concerns the marketing and use of biocides – products containing active substances that are used to protect humans, animals, materials or articles against harmful organisms, such as pests and bacteria. Approved in 2012, it is applicable from 1 September 2013, with a transitional period for certain provisions. All biocides to be placed on the market require authorisation, and the active substances they contain must be previously approved. The BPR is intended to harmonise the market at European Union level, simplify the authorisation and approval of active substances and introduce timelines for countries to evaluate substances, form opinions and make decisions. It also promotes reduction of animal testing by making data sharing mandatory and encouraging the use of alternative testing methods.

2.2. Other legislation related to chemicals

Chemical hazards are also managed within several other EU legal frameworks, such as legislation on fluorinated gases. Implementation of the Seveso Directive for the prevention of, preparedness for and response to chemical accidents in hazardous installations is provided for in an ordinance on the information to be provided by operators of establishments with a major accident risk.[6] The public that might be affected has to be informed about safety measures and what to do in case of an accident. Austria goes beyond the provisions of the directive, requiring this information to be supplied also by operators of lower-tier establishments, such as commercial installations (Section 9).

Under the 2003 UNECE protocol on pollutant release and transfer registers (PRTRs), the European Union has to establish an EU-wide PRTR comprising data from all EU countries' national registers.[7] In Austria, a publicly accessible online PRTR was established in 2007. It takes into account obligations under the UNECE protocol that go beyond the EU regulation (Section 8).[8]

Chemicals are also regulated through several multilateral environmental agreements, including the Stockholm Convention on Persistent Organic Pollutants, the Rotterdam Convention on Prior Informed Consent for certain hazardous chemicals and pesticides in international trade, and the Montreal Protocol on ozone-depleting substances.

3. The institutional setting for chemicals management

The authority charged with implementing legislation on the management of biocides and other chemicals is the BMLFUW. The Ministry of Economy, Family and Youth (BMWFJ) is responsible for legislation related to chemical accidents. Other ministries with partial or co-ordinating responsibility include the Ministry of Health, whose Food Safety Agency

co-ordinates with the BMLFUW on the safety of active ingredients in pesticides. The customs authorities are involved in enforcement of chemicals legislation.

The overall objective of the BMLFUW work on chemicals is to manage the tasks under REACH and the CLP and to ensure that Austria plays an active role in the EU chemicals management system. The ministry's work on chemicals management is co-ordinated through its chemicals and biocides directorates, where 27 people work in units covering REACH and the CLP, biocides and pesticides authorisation, detergents, restrictions on specific chemicals (e.g. fluorinated gases, solvents) and implementation of UN conventions and instruments. A planned merger of the biocides and chemicals units should increase efficiency and effectiveness. Recently the chemicals policy directorate was merged with the general directorate responsible for waste management issues to strengthen co-ordination between those two areas. The BMLFUW is also working to strengthen the policy links between waste management and chemicals.[9]

The ministry is supported by Environment Agency Austria, which manages the REACH Helpdesk, serves as Austria's access point to the central online reporting system (REACH-IT) and advises enforcement authorities and the ministry on REACH and CLP procedures, such as evaluation, authorisation, restriction, classification and labelling. The agency also designs and executes monitoring programmes, and hosts laboratories which carry out analytical work, such as sample analysis. Its chemicals and biocides unit employs 25 people.

Co-operation between the BMLFUW and other institutions is organised through an informal forum called the Austrian REACH platform. Participants include the *Land* enforcement authorities; the BMWFJ; the Ministry of Labour, Social Affairs and Consumer Protection (BMASK); the Ministry of Finance; the social partners; and non-government organisations (NGOs).

As in other areas, the public authorities and industry work closely together in the development and implementation of legislation. This builds on a long tradition of co-operation with the private sector, known as the *Sozialpartnerschaft* (Chapter 2). Overall, Austria's way of managing chemicals has met with broad public support. All stakeholder groups, including environmental NGOs, are involved in implementation and are generally satisfied with the progress to date.

The chemicals industry professional federation is the Austrian Chemicals Industry Association (FCIO), which is part of the Austrian Economic Chamber (WKÖ). As the chamber has a traditional right to participate in government decision making, there is close co-operation between industry and government in the development of legislation at the national, EU and even international levels.

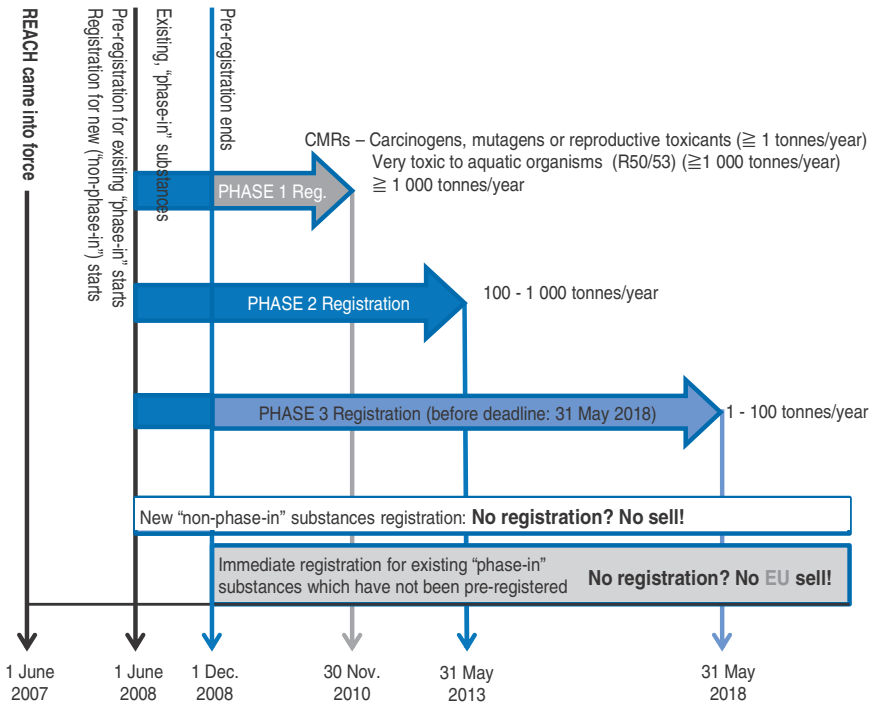
4. Implementation of the REACH and CLP regulations

4.1. *Registration*

REACH requires chemical companies to submit data to ECHA on substances' characteristics and properties, according to a schedule based on import and production tonnages and toxicity criteria, e.g. carcinogenicity (Figure 4.2).[10] Meeting the REACH and CLP deadlines is a significant challenge for all stakeholders, but particularly for small and medium-sized enterprises (SMEs) in the chemical industry as well as in chemical-using sectors (e.g. automotive, painting) that must comply with the regulations for certain product groups. For SMEs, which make up 90% of the firms subject to registration

requirements, compliance with REACH is more difficult and costly than for large firms. An assessment of the potential impact of REACH commissioned by the environment and economy ministries, the WKÖ and the Chamber for Worker Protection in 2005 estimated that whereas large companies would spend less than 2% of annual turnover on REACH implementation costs, the proportion for SMEs would be close to 8% (DENKSTAAT et al., 2005).

Figure 4.2. **REACH: Schedule for chemicals registration**



Source: Adapted from REACH Only Representative website (*www.reachor.com*).

Government and industry have established a strong, open working relationship to address the challenges involved in implementing REACH and to ensure that companies receive appropriate information. The FCIO and WKÖ, with active support from the economy and environment ministries, have organised national and state-level conferences and workshops regarding CLP and REACH. The government has supported development of guidance documents targeting SMEs. The BMLFUW and Environment Agency Austria also work with industry through the WKÖ to assist firms, especially SMEs, in implementing EU legislation.

There is also close co-operation between government and industry on the content and communication policy of the REACH Helpdesk.[11] Not only does the helpdesk provide advice about how to comply with REACH and CLP obligations, but it also provides information to consumers on high-concern substances in purchased products. A study by the European Consumers' Organisation concluded that the response of Austrian companies to consumer requests was high compared with most other EU countries, but

that, nevertheless, responsibilities along the supply chain to provide information to consumers remained for the most part unclear throughout the EU and that improvements were necessary (Mauer, 2012).

Despite the various government-industry initiatives, further support to industry, particularly SMEs, is needed to ensure that the 2013 and 2018 registration deadlines are met. Further efforts should be made to streamline the administrative burden of regulations and compliance monitoring on SMEs. Compliance promotion approaches more tailored to the needs in specific sectors could be developed (Mazur, 2012). The BMLFUW plans to work with the Labour Inspectorate in the BMASK to notify SMEs of their 2013 registration obligations, which would also be helpful in this regard.

4.2. Authorisation

Regarding substances of very high concern, EU countries must prepare dossiers (Annex XV dossiers) on the risks that specific SVHCs present so that it can be determined whether these substances should be put on the candidate list of substances requiring authorisation.[12] Inclusion of a substance on the candidate list triggers further REACH obligations for manufacturers, importers and users of the substance. Since 2008, Austria has prepared dossiers on nine substances, which makes it one of the most active EU countries in this respect.[13] It spends about EUR 50 000 per year on substance identification and candidate dossier preparation.

In the 2012 Federal Chemicals Act, Austria set a long-term objective of nominating two to three substances per year for inclusion on the candidate list, some in collaboration with Belgium, Poland or Germany. Environment Agency Austria has developed a procedure for selecting candidate substances using data gathered through scientific monitoring programmes on levels of SVHCs in humans and the environment, including data on exposure at the workplace. Initially the focus is on substances known to be carcinogenic, mutagenic or toxic to the reproductive system, followed by those which are persistent, bioaccumulative and toxic, then on potential SVHCs which have not been classified in these categories, such as endocrine disrupters and sensitisers. The final decision to nominate a substance – or to submit authorisation and restriction dossiers as a result of substance evaluation – is a political decision based not only on health and environmental criteria but also on considerations such as the availability and cost of substitutes. The decision involves several ministries.[14]

4.3. International co-operation in implementing REACH and CLP

Experience with the EU risk reduction instruments of authorisation and restriction, and in particular with the evaluation process under REACH, is still limited and evolving. Austria, like other EU countries, is still learning by doing. Experience of direct collaboration among countries under REACH and CLP is generally limited. Nevertheless, Austria has set an example by co-operating with other countries on issues such as authorisation policy and development of guidance for chemicals in articles such as clothing and packaging.

Given the complexity of the REACH and CLP requirements, successful implementation requires good co-operation, co-ordination and exchange of information not only between national authorities but also with the European Commission and ECHA. The latter plays an important role in communication by providing platforms for authorities dealing with specific aspects of REACH and CLP through its management board (chaired by Austria from

2008 to 2012), committees (Member States Committee, Committee for Socio-Economic Analysis, Committee for Risk Assessment), meetings of competent authorities and a forum for national enforcement authorities.

Table 4.1 shows that Austria participates actively in EU activities related to implementation of the regulations on chemicals. Despite resource constraints, on a per capita basis Austria has put more substances through these systems (via nominations to the candidate list, substance evaluations, dossiers for harmonised classification and labelling, rapporteurships, etc.) than any other EU country since 2007.

Table 4.1. **Austrian participation in ECHA activities related to REACH and CLP in 2007-11**

Description of activity	Indicators
REACH-IT access received (date)	31 May 2010
Participation in HelpNet meetings	Austria attended 12 out of 13 meetings
Number of HelpEx questions posted by Austria[a]	14
Number of comments posted by Austria on HelpEx questions	160
Participation in partner expert groups	Austria attended 13 out of 21 meetings
Participation in forum meetings	Austria attended all 12 meetings
Participation in forum working groups	Austria attended 5 out of 8 meetings
Austrian activity in REACH Information Portal for Enforcement (logins or equivalent)	168
Activity in Risk Communication Network (RCN)	Austrian REACH & CLP representatives attended 5 meetings in 2008-11[b]
Austrian activity in the Instrument for Pre-Accession Assistance Project	None
Participation in Member State Committee meetings	Austria attended all 23 meetings
Member State Committee rapporteur activity by Austria	None
Participation in Risk Assessment Committee meetings	Austria attended 17 out of 20 meetings
Risk Assessment Committee rapporteur activity	Austria served as rapporteur or co-rapporteur for 11 out of 187 meetings
Number of Risk Assessment Committee members appointed by Austria	4
Participation in Committee for Socio-Economic Analysis meetings	Austria attended all 14 meetings
Committee for Socio-Economic Analysis rapporteur activity	Austria served as rapporteur or co-rapporteur for 2 meetings
Number of Committee for Socio-Economic Analysis members appointed by Austria	4
Registrations submitted by Austria (dossiers)	496
Classification & labelling notifications submitted by Austria (dossiers)	2 664
Notifications submitted by Austria of substances in articles	21
Downstream user reports submitted by Austria	2
Austrian participation in the expert group on persistent, bioaccumulative and toxic properties of chemicals	Yes
Austrian participation in Exchange Network on Exposure Scenarios	Yes
Preparation of harmonised classification & labelling dossiers	Austria prepared 43 out of 175 dossiers submitted
Preparation of SVHC dossiers	Austria prepared 6 out of 90 dossiers submitted
Number of substances proposed by Austria for evaluation in the Community Rolling Action Plan	Austria prepared all 3 dossiers
Austria's proposals for amendments to REACH	None

a) HelpEx is a secure web-based discussion platform which allows ECHA HelpNet members to discuss difficult questions.
b) RCN activities were suspended in 2012 after resource constrains led to shifts in ECHA activity priorities.
Source: ECHA.

4.4. Enforcement of REACH and CLP

Enforcement of REACH and CLP is a national responsibility. Each EU country must ensure that it has an appropriate framework of penalties that is effective, proportionate and creates incentives for compliance. Enforcement generally involves a range of actions

that national authorities initiate to verify duty holders' compliance with the REACH and CLP regulations. Responsibilities include checking whether substances have been registered or pre-registered and verifying the availability and accuracy of safety data sheets.

Monitoring activities cover producers, importers, wholesale and retail distributors, and downstream users. The CLP does not fundamentally change the legislative system that has been in force for many years, but enforcement must now deal with both the current system and the transition to the new system. Although the new system came into force in 2012, the transitional period will last for several years.

In Austria, environmental legislation is implemented by the nine *Länder*, which apply and enforce federal law through inspectorates. Controls are carried out by the 25 *Land* inspectors, based on guidance and training provided by Environment Agency Austria. The number of chemicals inspectors has not changed following the implementation of REACH, implying that inspectors' responsibilities have increased. Inspection plans are prepared by the inspectorates and co-ordinated with the BMLFUW to ensure that REACH obligations are enforced as comprehensively as possible. Special issues (companies, branches, products) are regularly selected as a focus for enforcement authorities. The chemicals inspectorates report to the BMLFUW on their activities and meet for training and co-ordination twice a year to ensure good planning and co-ordination of inspection activities, not only for REACH but also for other regulations and directives, such as those on VOCs, persistent organic pollutants (POPs), ozone-depleting substances, fluorinated gases and biocides.

Since 2010, enforcement officers from the *Land* chemicals inspectorates have co-operated with officers responsible for enforcing occupational health legislation regarding use of chemicals in the workplace. Austria plans to establish similar enforcement co-operation agreements between the chemicals inspectorates and the authorities responsible for enforcing provisions on water protection, beginning with joint seminars and workshops.

Many chemicals inspectors have other duties besides enforcing chemicals legislation, so the effective capacity is less than the number of inspectors implies. Nevertheless, between 2007 and 2009, 630 REACH inspections were performed in Austria: on-site controls, sampling, review of documentation, etc. Some 57% of the inspections entailed verifying that information was available throughout the supply chain. Sanctions for non-compliance and breaches of registration and authorisation requirements have been codified in a multiphase system that includes administrative sanctions (fines) and criminal penalties for REACH infringement. The enforcement measures most often applied to date have been coercive, rather than punitive, and involve asking the offender to comply with legal requirements (Milieu, 2010). More stringent penalties for non-compliance may need to be applied as experience with REACH develops.

ECHA has no enforcement responsibilities since it is an EU-level institution, but it hosts the Forum for Exchange of Information on Enforcement, composed of representatives of national enforcement authorities. The forum facilitates exchange of information and co-ordination of enforcement activities related to REACH and CLP. Austria has been very active in the forum and puts a high priority on EU-wide projects developed through it.[15]

5. Biocidal products

A specific legal framework was designed in Austria to implement the EU legislation on biocides. Authorisation procedures for marketing of biocides began in 2010. For all biocidal products, Austrian chemical legislation applies, under the authority of the BMLFUW. An assessment of compliance with EU directives on biocides conducted by the Chemical Legislation European Enforcement Network (CLEEN) indicated that Austria is one of the five EU countries with the most non-compliant products (Box 4.4).

Box 4.4. **CLEEN: Network on enforcement of biocide legislation**

Austria takes part in the informal Chemical Legislation European Enforcement Network, which co-ordinates and improves enforcement of EU chemicals and biocides legislation. Under the auspices of CLEEN, chemical inspectors of the EU Member States and other European countries set priorities for joint enforcement projects to facilitate information exchange and prepare recommendations to the European Commission regarding enforcement of REACH. The CLEEN EuroBiocides project started in 2005 with the aim to provide insights into the extent to which industry complies with the requirements of the 1998 Biocidal Products Directive, along with the enforceability of the directive. The final report, published in May 2011, showed that in Austria and four other countries (Norway, Denmark, Belgium and Finland) the number of products not in compliance was between 10% and 50% higher than in other countries. The report recommended that governments:

- raise public awareness of existing problems and highlight the need for public information and general monitoring of issues related to biocides.
- inform downstream users, professionals, retailers and wholesalers about legislation, status of active substances and any other biocide issues.
- support enforcement strategies and produce information which can reduce the number of products not in compliance with the directive.

Source: CLEEN (2011).

Plant protection products and biocides will have very similar authorisation procedures once the BPR enters into force in September 2013 (Section 2.1). Hazard assessment of the active substances in biocides and plant protection products – which are often the same – is carried out in the same way, using the procedures developed for plant protection products. Assessment of occupational exposure is also similar. The same maximum residue levels apply if a biocide is used in a plant protection product.[16] Risk assessment of biocides differs, depending on which of the 23 product groups they fall into, but has many similarities to that for ecotoxicological assessment of plant protection products. As there are many similarities in the testing requirements, the expertise needed to interpret their results is largely the same. Recently, a number of dossiers for harmonised classification and labelling were submitted for biocides and plant protection products. A long-term target is for Austria to submit two such dossiers per year. As Austria begins implementing the biocides regulation, the coherence and efficiency of the biocide and plant production product management programme would be enhanced by increased co-operation, e.g. on hazard assessment, authorisation procedures and occupational exposure assessment.

6. Nanomaterials

A debate on regulation of nanomaterials was initiated in Austria in 2006. An initial parliamentary inquiry was made in 2007. The same year, the Bioethics Commission at the Federal Chancellery adopted a recommendation on nanotechnology. In 2008, the debate gained momentum with several conferences. In 2010, the Nanotechnology Action Plan was adopted. The government is now discussing a regulation for nanotechnology, which would also deal with the safety of nanomaterials.

The Nanotechnology Action Plan focuses on the advantages and risks of nanomaterials, as well as on co-operation and information exchange (BMLFUW, 2009). It presents 50 recommendations in the fields of environment, health and safety, recommending that they be implemented by 2012 (Box 4.5). Further actions may be proposed on the basis of experience gained. It is important for the many measures in the plan to receive appropriate, and appropriately funded, follow-up in coming years.

The action plan was developed through an extensive consultative process involving a wide range of stakeholders and five ministries, co-ordinated by the BMLFUW.[17] This process is generally considered within Austria to provide a good model of how to develop a consensus on addressing a controversial, science-based policy issue (OECD, 2012). In the follow-up process, a continuous dialogue with experts from German-speaking neighbour countries (Germany, Liechtenstein, Switzerland) has been established. Called Nanodialogue, it is intended to establish a benchmarking system for policy approaches to nanomaterials.[18]

Box 4.5. **Key measures in the Nanotechnology Action Plan**

The action plan presents 50 recommendations for action at national, EU and international level. Based on a consensus among stakeholders, it aims to provide a strategic framework for the governance of nanotechnology and nanomaterials and to co-ordinate the various Austrian activities in the field. Key recommendations include:

- establishing a nanotechnology information platform to facilitate dialogue among experts from a wide variety of fields, along with other stakeholders and the public.
- communicating issues in language the public can understand and strengthening co-operation with the media using existing structures and best practices.
- reviewing the legal framework with a view to ensuring a high level of protection for the environment and human health, and providing a basis for formulating the Austrian position in EU and other international discussions.
- strengthening research, including co-operation between government and industry and international co-operation.
- addressing issues such as funding that might impede further development of nanotechnology companies, including SMEs.
- further developing capacity to address potential health, environmental and safety issues associated with nanomaterials.

Source: BMLFUW (2009).

7. Monitoring of hazardous substances

Austria has many programmes for monitoring hazardous chemicals. The context for the monitoring varies and takes account of EU requirements (e.g. the Water Framework Directive) and the need to provide a scientific basis for the selection of chemicals as candidates for authorisation or restriction under REACH. However, there is a large number of monitoring programmes, which makes planning and co-ordination a challenge. It also weakens the contribution of monitoring to decision making.

7.1. Endocrine-disrupting substances and phthalates

In response to growing public concern, monitoring of suspected endocrine-disrupting chemicals, such as bisphenol A and some phthalates used in plastics, began in Austria about ten years ago. A project completed in 2003 aimed at describing the fate and behaviour of selected endocrine-disrupting substances in Austrian water bodies (Bursch et al., 2004). The project showed that contamination of Austrian freshwater ecosystems with such substances was comparatively low, and that there was no evidence of risk to human health, but that decomposition of certain detergents and pharmaceuticals presented some risk to fish. It highlighted the importance not only of providing adequate wastewater treatment but also of replacing certain endocrine disruptors with safer alternatives. Risk management measures for these chemicals under REACH are expected to create incentives for the development of safer substitutes.

In the context of REACH implementation, a hot-spot monitoring programme has been designed to measure exposure to chemicals used in the anthroposphere.[19] It will support the preparation of dossiers on candidate substances for authorisation. The monitoring programme comprises fixed monitoring sites (groundwater, surface water, sewage treatment plants, indoor, etc.), which are selected and investigated depending on the expected distribution of the substance under examination. Phthalates have been a major focus of monitoring activities. The Austrian authorities have envisaged submitting phthalates to an authorisation procedure under REACH, mainly on grounds of their potential impact on the reproductive system and suspected endocrine-disrupting properties (Box 4.6). A recent example involved monitoring 13 phthalates in house dust, sewage sludge and sediments. The survey led to Austria's nomination of some of them as candidates for authorisation as SVHCs.

Box 4.6. **Phthalate monitoring in Austria**

Phthalates are used as softeners in plastics. Many of them have wide dispersive uses and can be found in the environment (e.g. in water, sediment, sewage and biota), in indoor air and in many frequently used consumer products, including shoes, toys and cosmetic accessories such as brushes. Phthalates are very persistent and are produced in high volumes. There have been cases of them being found in very high concentrations, especially in matrices where they can be adsorbed onto particles (e.g. sediment, sewage sludge, household dust and particulates, both PM_{10} and $PM_{2.5}$). Recent measurements of the body burden of phthalates in humans has included phthalate metabolites in urine.

In 2008, Austria submitted SVHC dossiers for benzylbutylphthalate and dibutylphthalate. These substances were included in Annex XIV of REACH in February 2011 and their use will be subject to authorisation in the near future.

A 2009 human biomonitoring survey (Umweltbundesamt, 2011) initiated by the BMLFUW was designed as a cross-sectional study to determine the exposure of the general Austrian population to specific environmental contaminants (Box 4.7). The burden of chemicals in the body was investigated in several age groups. Urine samples were analysed for phthalate metabolites, trisphosphates, octylphenol, nonylphenol and bisphenol A. Blood samples were tested for polybrominated diphenyl ethers (PBDEs) and hair samples for methyl mercury. The results showed a body burden of phthalates and PBDEs in the Austrian population. Children are especially exposed to these chemicals, which are found in consumer products. Trisphosphates were identified in three samples. Methyl mercury, which is taken up primarily through fish consumption, was identified in low concentrations compared to countries with high fish and seafood consumption.

As part of an EU programme, a biomonitoring survey was conducted on pregnant women and newborns in Bratislava and Vienna to measure heavy metals, methyl mercury, bisphenol A and perfluorinated compounds. Other Austrian biomonitoring studies have found heavy metals in the bodies of schoolchildren (Umweltbundesamt, 2011). Biomonitoring studies have been limited thus far to a few hazardous chemicals. Broader monitoring of more substances in humans is required to establish further priorities for risk management regarding chemicals of concern.

Box 4.7. **Human biomonitoring**

The massive and diverse use of industrial chemicals results in increased exposure of humans to chemicals. Studies reveal that a variety of synthetic substances can already be detected in the human body. Taken up through various exposure routes, they are either stored in body tissues or metabolised and excreted. The procedure to detect the presence of certain substances or metabolites in the human body is called human biomonitoring. Urine, blood, milk, hair and tissue samples are most frequently used to identify the individual body burden. Studies demonstrate exposure trends, differences in subpopulations (notably vulnerable groups such as children – especially toddlers – and pregnant women), and local and regional differences.

7.2. Hazardous substances (pesticides and surfactants) in water bodies

In the framework of pollution control legislation, monitoring of water bodies is carried out on a regular basis. Around 2 000 groundwater monitoring sites, 250 river sites and 360 sediment sites are sampled several times per year. The only substances of concern which exceed the limit values at some sites are nitrates, the pesticide atrazine and its metabolite desethyl atrazine. However, concentrations have been steadily decreasing in recent years. Almost 80% of the sample points of Austrian rivers and lakes were found to have a “good” or “very good” status as regards the amount of hazardous substances found (Umweltbundesamt, 2010a).

In 2010 a special monitoring programme for 121 pesticides and pesticide components was carried out on selected groundwater and river sites considered at risk for pesticide contamination (Box 4.8). Measurements showed that overall environmental quality standards were met. Nonetheless, the conclusions of the special monitoring programme emphasise that sustainable and controlled use of pesticides is important to protect the

Box 4.8. **Pesticides in groundwater and rivers**

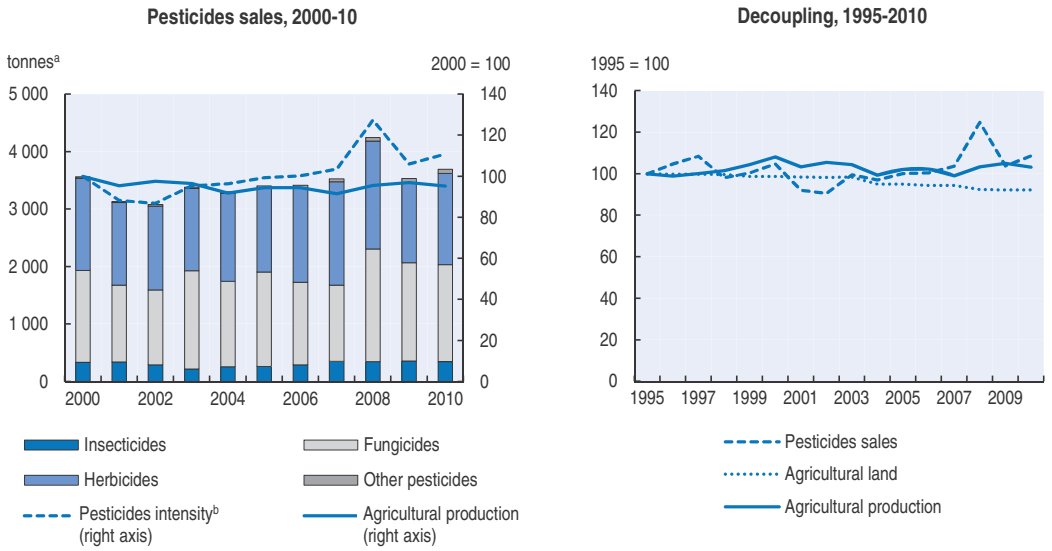
Groundwater areas extend to nearly one-third of the national territory. Nearly all drinking water consumed in the country is groundwater, a level unique in Europe. In 2010, a special monitoring programme targeted selected groundwater and river monitoring sites that could be threatened by pesticide contamination. Special attention was paid to the active substances of pesticides and their metabolites, which had not been monitored before; in all, 121 substances were monitored at 201 sites. At 92 sites (about 46%), the measured values exceeded the threshold levels for at least one substance. At 33 sites, multiple exceedances were measured. Of the 121 substances measured, 50 could be detected in groundwater, albeit at values well below the acceptable daily intake standards for drinking water. The groundwater contamination types often differed significantly and could be correlated with agricultural use. The measurements at river monitoring stations showed no exceedances of current environmental quality standards, but several substances for which no standards have yet been adopted were present in elevated concentrations (Umweltbundesamt, 2010b).

Source: Umweltbundesamt (2010b).

aquatic environment and the drinking water supply and to keep concentrations in water bodies as low as possible (Umweltbundesamt, 2010b).

Despite substantial subsidies for sustainable rural development and organic farming, however, pesticide sales in Austria did not decrease during the 2000s. The quantity of pesticides sold per square kilometre of farmland has tended to grow over the period while agricultural production has been essentially unchanged (Figure 4.3). Austria might wish to look into other ways of reducing pesticide use, such as a tax on pesticides.

Figure 4.3. **Sales of pesticides**



a) Weight of active ingredients.
b) Based on data expressed in terms of kg of active ingredients per km^2 of agricultural land.
Source: FAO (2013), *FAOSTAT* (database).

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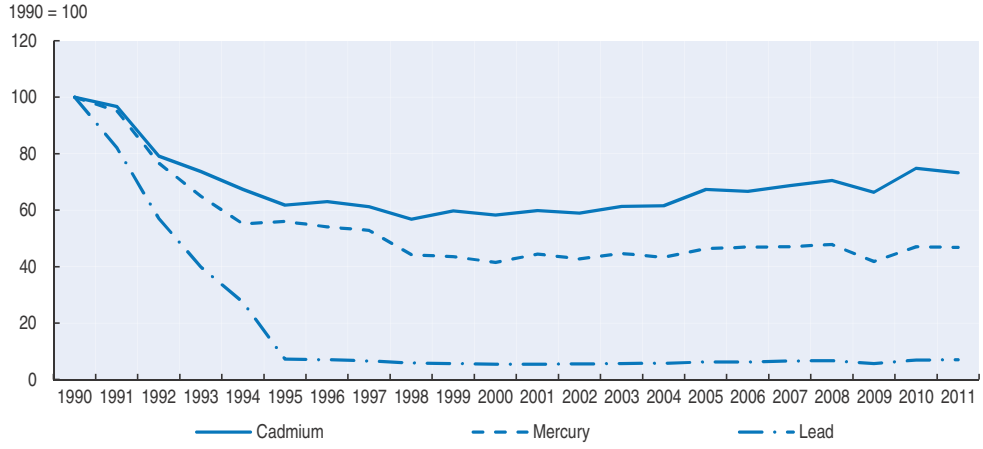
EU Regulation 648/2004/EC on detergents lays down degradation limits for surfactants such as linear alkyl sodium sulphonates (LAS), which are toxic to the reproductive system. In 1994-95, monitored concentrations of LAS in small rivers were around 820 µg/L, but by 2009-10 they were significantly lower, no more than 23 µg/L. This positive development has been attributed not only to the detergent legislation but also to the construction of wastewater treatment facilities.

7.3. Hazardous substances in ambient air

Levels of hazardous substances in air, such as POPs and heavy metals, as well as other pollutants are monitored regularly and reported in the Austrian National Emission Inventory, in accordance with the requirements of various international and EU agreements and the national air pollution control legislation.[20] Trend analysis (Umweltbundesamt, 2012) shows that cadmium, mercury and lead, which affect human health, have decreased significantly over the past two decades, but that both cadmium and mercury emissions are once again increasing (Figure 4.4).[21] The ban on leaded gasoline and the reduction in the use of coal and heating oil as well as flue gas cleaning technologies are responsible for the huge decrease in lead emissions. The rise in cadmium and mercury emissions in recent years is due primarily to increased use of biomass in power plants and industry, and to higher steel and iron production. The slight reduction in heavy metal emissions in 2008-09 reflects the reduced economic activity in those years.

Figure 4.4. **Heavy metal emissions**



Source: UNECE/EMEP (2013), *WebDab* (database).

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The same analysis shows that dioxin emissions in Austria have decreased by 76% in the past twenty years, with only 39 g being emitted in 2010. Hexachlorobenzene emissions dropped by 55% to 41 kg. Emissions of polycyclic aromatic hydrocarbons (PAHs) fell by 54% in the same period, to 8 tonnes. The positive trends are due to measures by industry and by waste burning installations to reduce emissions through process and technology innovations. Small, private firing plants and furnaces are the predominant emission sources (60-70%) for PAHs and dioxins. The publication and dissemination of a brochure on heating addressed to consumers and professionals such as chimney sweeps was an

important risk reduction measure. The brochure, published by the BMLFUW, explains ways of heating and firing which avoid high emissions of these pollutants (BMLFUW, 2010).

In the framework of Austria's obligations under the Stockholm Convention on Persistent Organic Pollutants, there are a number of monitoring programmes targeting POPs. Studies to measure POPs and other organic pollutants far from emission sources have shown that grassland soils in Austria are considerably affected by ubiquitous loads of POPs (Umweltbundesamt, 2010c).

Another project, carried out in co-operation with Germany, Italy, Slovenia and Switzerland (the MONARPOP Project), aims to monitor POPs in remote alpine regions to assess issues such as long-range transport, prevalent source directions, variation with altitude and possible biological effects of detected loads. Generally, higher POP concentrations have been found in the peripheral zones of the Alps, while the central and middle Alps are less polluted. The evidence demonstrates the role of the Alps as a barrier to long-range transboundary air pollution. A number of monitoring projects are carried out in co-operation with other countries, such as UM-MuKi with the Slovak Republic.

It is not clear that the results of these monitoring studies always influence policy making on risk reduction measures in Austria. The increased mercury and cadmium emission levels and the concentrations of POPs in grassland soils are examples. This is in contrast with the exemplary use of phthalate monitoring studies to trigger preparation of in-depth dossiers on SVHCs for consideration in the REACH authorisation process (Box 4.6).

8. The pollutant release and transfer register

Austria provides information to the public in a generally coherent, user friendly and effective way. *Chem News,* published about every two years, is a good example. Public consultations are regularly held as legislation is developed.

In the last *Environmental Performance Review*, the OECD recommended that Austria "introduce a pollutant release and transfer register (PRTR) and assure public access to the data thus generated" (OECD, 2003). Austria did establish a national PRTR in 2007, being one of the last EU countries to do so, although it had reported as required to the EU's European Pollutant Emission Register system since 2001 on emissions of 50 substances. The Austrian PRTR is run by Environment Agency Austria, which maintains a publicly accessible national electronic database with information from the 150 or so largest industrial installations, including chemicals manufacturers. However, as the chemicals industry uses many processes and produces a variety of products, it is difficult to estimate which processes result in release of post-threshold amounts of PRTR substances and greenhouse gases.[22]

Since 2009, Austria, like all EU countries, has reported annually on releases to air, water and land, off-site waste transfers and off-site transfers of pollutants (including heavy metals, pesticides, and dioxins) in wastewater. It also reports on releases and transfers of 91 key pollutants. In addition to the data required by the EU regulation, Austria includes releases from diffuse sources (such as transport or households) to air and water (OECD, 2010).

The aim of a PRTR is to provide information to the general public, industry and government to assist decision making and limit the impact of pollutants on human health and the environment. While there is some evidence that information provided to the PRTR, particularly that related to air and water pollution, is used for policy purposes,[23] the PRTR

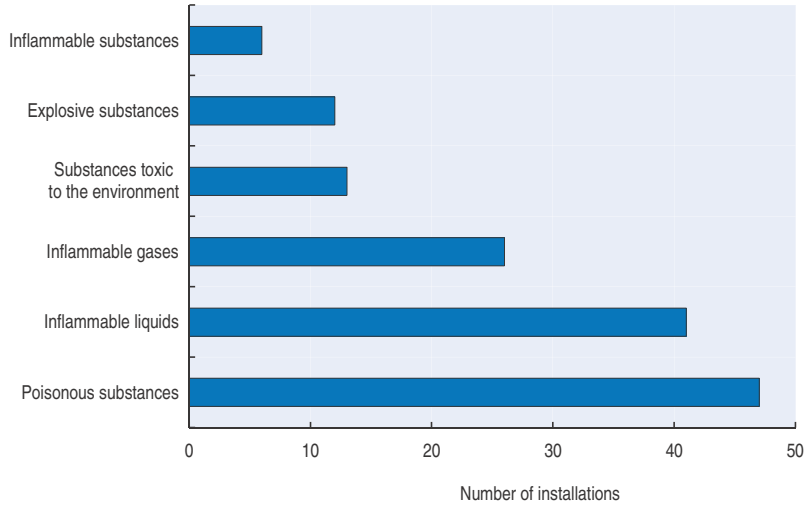
does not seem to be used by the Austrian public to the same extent as in some other EU countries. It lacks the transparency and user-friendliness needed to make it accessible to the public. Further efforts should be made to address these issues so as to better achieve the intended objectives of PRTRs.

9. Chemical accidents

The Ministry for Economy, Family and Youth is responsible for implementation of the Seveso Directive, but the BMLFUW holds certain related responsibilities, as does the Ministry for the Interior (on transboundary effects of major accidents). Inspectors for the *Länder* carry out inspections under the auspices of the economy ministry. Austria has 148 installations holding sufficient quantities of dangerous substances to be classified under the Seveso Directive. The number has remained almost constant over the past ten years. The installations are listed at the central registration office of the economy ministry, which issues annual reports on accidents. Very few accidents have been reported to the European MARS system, which documents major accidents under the Seveso Directive: one in 2003, one in 2004, three in 2006 and one in 2008.

A 2008 report commissioned by the BMLFUW analysed the effects of Seveso Directive implementation in Austria. It concluded that industry compliance on providing information to the public about preparedness and response to major accidents was not at the same level in all installations, although it had improved significantly under the Seveso II Directive, as had the overall safety level in Austria (Binter, 2008). Nevertheless, the report suggested that both operators and public authorities needed to be more proactive. Another challenge is related to the need for the land-use planning implications of major-accident hazards to be taken into account in the regulatory process. This is complicated in Austria, where land-use planning policies come under a variety of jurisdictions.

Figure 4.5. **Seveso installations by substance group**



Source: Binter (2008).

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10. Green chemistry

More stringent regulatory requirements provide incentives to producers to develop green chemistry solutions, i.e. to design chemical products and processes that reduce or eliminate the use or generation of hazardous substances and of environmental impacts more generally. The Austrian system for research funding provides additional incentives. Expenditure on research and development accounts for 17.5% of chemicals industry spending, and the industry is among the most research-intensive sectors in Austria. Financing from foreign sources in corporate research in Austria is double the EU average.

In 2011, the International Year of Chemistry, the BMLFUW organised a symposium on green chemistry. The symposium brought together scientists, interest groups, stakeholders and experts from administrations to discuss current research and develop perspectives for future activities. Following the symposium, a permanent discussion platform on green chemistry was established, and a study project is being commissioned to summarise green chemistry activities.

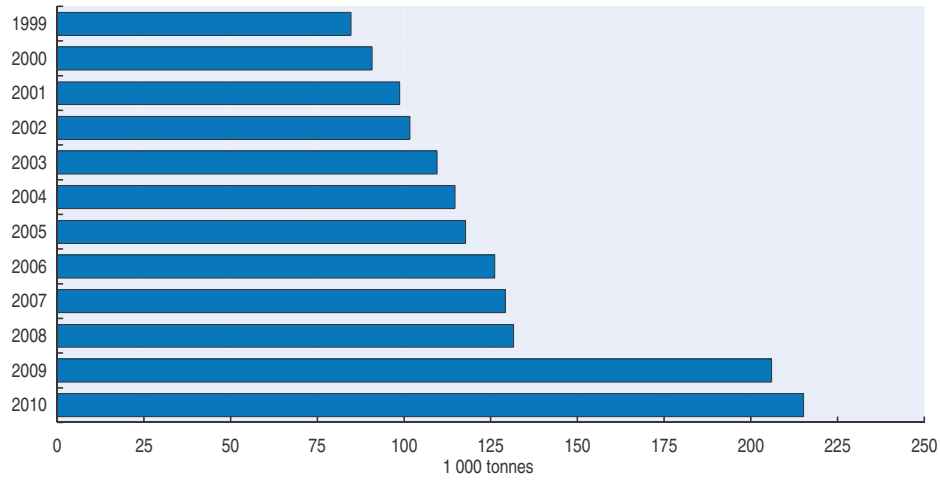
In addition, a platform has been established to exchange information about the substitution of less hazardous alternatives to hazardous chemicals. This effort, which began under the old International Forum on Chemical Safety, has been further developed in a "substitution portal" project supported by the EU, Germany and Austria to give a worldwide overview of approaches towards substitution.[24] The portal will be linked with Austria's chemical leasing initiative (see below) as well as with Austria's work within the authorisation part of REACH, in which substitution is a key element.

10.1. *Improving the environmental performance of chemicals production processes*

The chemicals sector has improved the environmental performance of its production processes in Austria and, on average, in Europe.[25] For example, recycling of the chemicals in plastics has grown considerably (Figure 4.6). Chemicals companies are increasingly looking at advanced recovery and recycling technologies to recover hydrocarbons locked within used and disposed-of plastics and polymers, thereby reducing their environmental impact.[26] The Austrian plastic recycling company Altstoff Recycling Austria recycled 215 165 tonnes of plastic in 2010.[27] The resulting plastic granules are used to manufacture new plastic products. They also serve as raw materials for the chemicals industry as well as for the incineration with heat recovery.

Due to efforts in cleaner production and efficient use of energy and raw materials, there has been a clear decoupling of greenhouse gas (GHG) emissions from production in the chemicals industry. GHG emissions related to chemicals industrial processes (excluding emissions from energy use in the sector) were reduced by over 50% from 2000 to 2011 (Figure 4.7). A 2009 report concluded that, taking a full carbon life cycle approach, for every unit of GHG emitted by the chemicals sector, the products of the sector enabled GHG savings two to three times greater than the emissions – a ratio that can rise to 4 to 1 under the right conditions (ICCA, 2009). This amounts to savings of up to 5.2 billion tonnes of CO_2. The study also identified opportunities for the chemicals sector to contribute to wider GHG savings through the development of green products such as insulating foams in buildings, agrochemicals, lighting, plastic packaging, automotive plastics, low-temperature detergents, engine efficiency techniques, synthetic textiles and marine antifouling coatings.

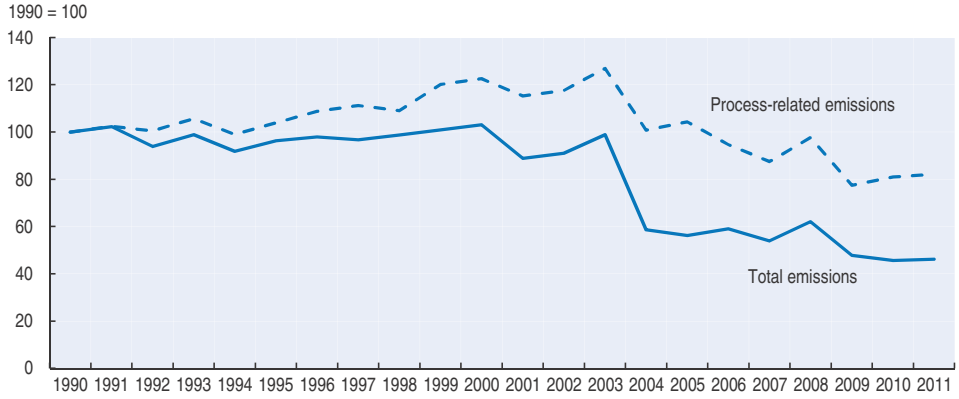
Figure 4.6. **Recycled plastic packaging**



Source: Austrian Federal Economic Chamber; Autrian Plastic Recycling.

StatLink http://dx.doi.org/10.1787/888932895330

Figure 4.7. **Greenhouse gas emissions by the Austrian chemicals industry**



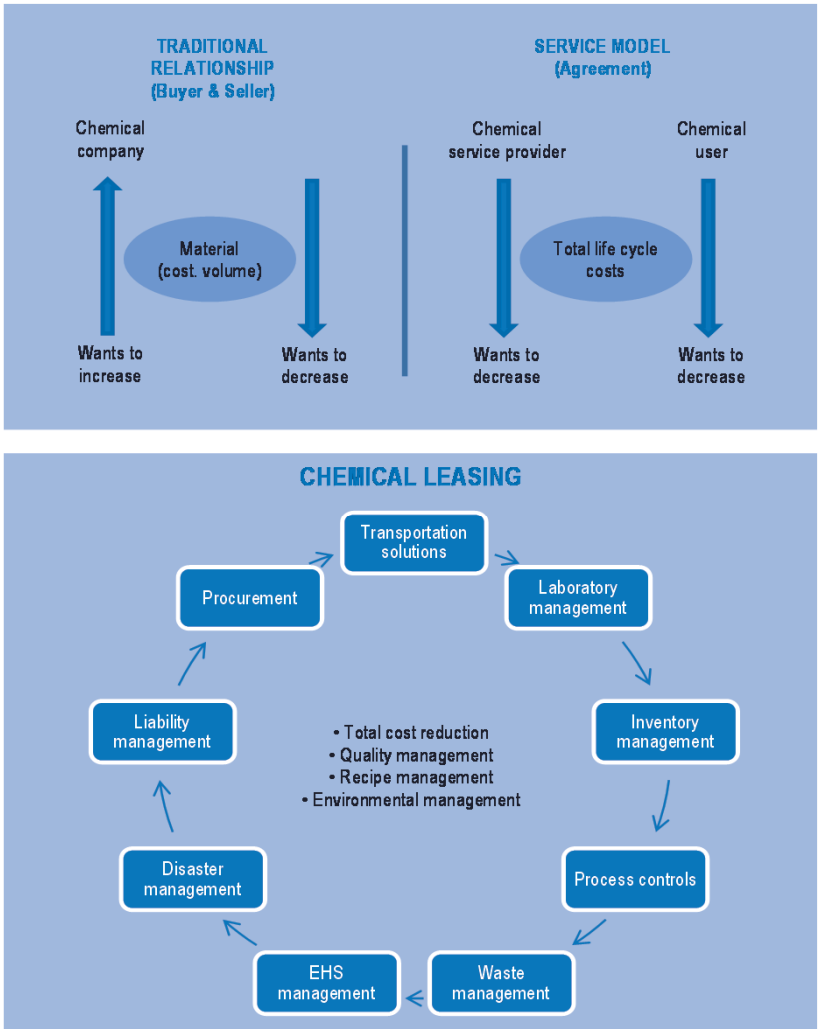
Source: UNFCCC (2013), *UNFCCC Data Interface.*

StatLink http://dx.doi.org/10.1787/888932895349

10.2. Chemicals leasing

Austria has pioneered chemicals leasing as a way to further reduce risks to human health and the environment from the use of chemicals. Traditionally, suppliers have an interest in selling as much chemicals quantity as possible to end users. By contrast, end users have an interest in minimising chemicals purchases, and must put in place systems to manage potential health or environmental risks associated with chemicals' use and disposal. Chemicals leasing changes the incentive structure. The supplier sells services provided by chemicals (e.g. powder coating, dyeing, painting) but retains ownership of the chemicals. The end user only pays for these services, rather than the volume of chemicals consumed, while retaining ownership of machinery and responsibility for the manufacturing process (Figure 4.8). Thus suppliers and end users have a common interest in redesigning processes to minimise losses of chemicals to the environment. By

Figure 4.8. **The concept of chemicals leasing**



Source: Adapted from UNIDO Chemical leasing initiative (www.chemicalleasing.com).

decoupling payment from the consumption of chemicals, chemicals leasing can encourage better chemicals management, generating both environmental and economic benefits (UNIDO, 2011).

Austria considers chemicals leasing to provide a means of complying with REACH obligations. Chemicals leasing and REACH share a philosophy of ensuring compliance with a duty of care, and provide a way of demonstrating adequate control. The Austrian and German governments are working together to bring chemicals leasing within the purview of EU chemicals policy and regulations.

Studies commissioned by the BMLFUW have shown that, potentially, almost 4 000 Austrian companies could benefit from chemicals leasing, cutting the annual use of 150 000 tonnes of chemicals by one-third. One study suggested that the average cost saving achieved by chemicals leasing would be about 15% (Jakl and Schwager, 2008). However, uptake of chemicals leasing has fallen short of the potential. Drawing on similar

experiences with energy efficiency and cleaner production, Austria should examine obstacles to wider application to identify how they could be overcome.

Austria has also been active in promoting chemicals leasing internationally. In 2004, the Austrian government and the United Nations Industrial Development Organisation began co-operating to promote chemicals leasing internationally. Five years later, the German government joined this initiative. Chemical leasing projects were initiated in 2005 in Egypt, Mexico and Russia, followed in 2008 by projects in Colombia, Morocco, Serbia and Sri Lanka. All were sponsored by Austria.

11. International co-operation on chemicals management

Austria plays an active role in international co-operation on chemicals management. It works with partners in the region, especially German-speaking countries, and with bilateral partners in the global chemicals management context to undertake initiatives related to risk management. It supports development of a new instrument on mercury and consolidation of institutions working on chemicals-related issues at global level to address policy fragmentation and avoid duplication of effort. Austria has ratified the main chemicals conventions (see below). However, it has not yet fully implemented the UNECE Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Chapter 2). More transparency and public participation in environmental decision making in such issues as the siting of industrial installations, including those producing chemicals and pesticides, would be desirable in Austria.

Austria ratified the Vienna Convention in 1987 and its Montreal Protocol on ozone-depleting substances in 1989, and was active from the beginning of the negotiations resulting in the phasing out of chlorofluorocarbons and hydrochlorofluorocarbons.

Austria ratified the Stockholm Convention on Persistent Organic Pollutants in 2002. In 2012 it revised its national implementation plan on elimination and reduction of POPs to include a national action plan on unintentionally produced POPs (PCDD/F, PCBs, HCB, PeCB, PAHs). Key aspects of the revised plan are continued monitoring in the Alps (MONARPOP); strict control of compliance with the EU Regulation on POPs,[28] especially for products, which is enforced by specialised inspectors in the *Länder*; and prevention of pollution related to POP waste.

Austria ratified the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade in 2002. As required by the convention, Austria has regularly informed importing parties of the intention to export substances that are banned or severely restricted within Austria and the EU, that are not subject to the PIC procedure.[29]

Environment Agency Austria actively participates in EU-funded "twinning" projects in the area of chemicals policy. By entering into close partnership with corresponding institutions in new and future EU countries, as well as partner countries in Eastern Europe and the southern Mediterranean, the agency supports the development and implementation of chemicals management programmes in those countries in line with EU requirements. Activities include study visits and secondments, advice on the role and organisation of competent authorities for chemicals issues within the EU, transfer of best practices in safe management of chemicals, support for inspection programmes and specialised laboratories. Bulgaria, Croatia, Romania, Serbia and others have been partners

in projects of this kind. Contacts established within this framework form a valuable basis for continuing co-operation.

Austria participates in efforts to implement the Strategic Approach to International Chemicals Management (SAICM), adopted in 2006 by the International Conference on Chemicals Management. The objective of this non-binding UN initiative is to achieve sound management of chemicals throughout their life cycle so that, by 2020, chemicals are used and produced in ways that lead to minimisation of significant adverse effects on human health and the environment. More than 150 countries participate in this effort. As envisaged in SAICM's Overarching Policy Strategy, initial capacity-building activities for reaching SAICM objectives are supported through its Quick Start Programme (QSP). The QSP includes a voluntary, time-limited trust fund, administered by the United Nations Environment Programme, and multilateral, bilateral and other forms of co-operation. Austria has regularly contributed to the fund, as one of 21 donors, since its establishment in 2006, contributing almost 2% of total QSP funding to date.

Austria attends the meetings of the OECD Chemicals Committee and takes an active part in selected activities under the OECD Chemicals Programme, notably the Task Force on Biocides, which it has chaired for several years, and the Working Group on the Safety of Manufactured Nanomaterials, where it played a major role in organising a recent workshop in Slovenia to assist in raising awareness on nanosafety issues. It also participates in the work on test guidelines and good laboratory practice and has sponsored seven chemicals to be assessed under the Co-operative Chemicals Assessment Programme, but has not yet taken an active part in the co-operative assessment work itself.

Notes

1. Germany is the largest chemicals producer in Europe, followed by France, Italy and the Netherlands. Together, these four countries generated 64% of EU chemicals sales in 2010, valued at EUR 315 billion. The share rises to 89%, or EUR 437 billion, with the addition of the United Kingdom, Spain, Belgium and Poland. The other 19 EU countries generated 11% of EU chemicals sales in 2010, valued at EUR 54 billion, half of it attributable to Sweden, Austria, the Czech Republic and Finland (CEFIC, 2011).
2. The exception was 2009, when both imports and exports fell by about 10% compared with 2008.
3. About a thousand international companies, many of them multinationals, co-ordinate their eastern European business outreach from Austria (ABA, 2011).
4. REACH: Regulation (EC) No. 1907/2006; CLP: Regulation (EC) No. 1272/2008; BPR: Regulation (EC) No. 528/2012.
5. Several other laws also apply to chemicals management – for example, on poisons and fluorinated gases – but they will not be considered further here.
6. Major accidents in the chemicals industry have occurred worldwide. In Europe, the Seveso accident in 1976 prompted the adoption of legislation aimed at the prevention and control of such accidents. In 1982, EU Directive 82/501/EEC, known as the Seveso Directive, was adopted. In 1996, it was replaced by Directive 96/82/EC, or Seveso II. This directive was extended by Directive 2003/105/EC and applies to thousands of industrial establishments where dangerous substances are present in quantities exceeding specified thresholds. In 2012, Seveso III (Directive 2012/18/EU) was adopted; it comes into force in 2015. It includes stronger requirements for provision of information to the public and access to justice.
7. Regulation (EC) No. 2006/166/EC.
8. Certain other regulations on chemicals management in force in Austria go beyond EU legislation, such as the 2011 Poisons Act, which regulates sales of poisons and preparations containing poisons through a licensing procedure. The regulation aims at ensuring that only customers with documented expertise or experience are entitled to purchase these severely hazardous products.

9. The effects of a substance when it becomes waste has to be taken into consideration in the context of REACH implementation, and there are many other links between waste and chemicals management that also should be emphasised. As the borderline between "product" and "waste" is of key importance for life-cycle chemicals management, enforcement in Austria puts particular focus on that question. Together with stakeholder organisations, the BMLFUW is holding workshops highlighting specific situations and borderline cases, and trying to elaborate ways to deal with them.
10. Companies that produced or imported chemicals having certain properties hazardous to human health or the environment had to register these substances in 2010. The next deadline is 2013, for substances produced or imported in volumes between 100 and 1 000 tonnes a year, and 2018 is the deadline for substances produced in volumes below 100 tonnes.
11. Österreichischer REACH-Helpdesk: *www.reachhelpdesk.at*.
12. SVHCs must meet one or more of the following criteria: Class 1 or 2 carcinogen; Class 1 or 2 mutagen; Class 1 or 2 toxic for reproduction; PBT (persistent, bioaccumulataive and toxic); vPvB (very persistent and very bio-accumulative); or evidence of an equivalent degree of concern (e.g. endocrine disruptors).
13. The substances are benzylbutylphthalate, dibutylphthalate, 2-ethoxyethanol, 2-methoxyethanol, 2-ethoxyethylacetate, diglyme, tris-2-chloroethyl-phosphate), di-isopentylphthalate and azo-di-carbonamide.
14. The ministries involved are those dealing with the economy, social affairs, health, and environment.
15. EU-wide co-ordinated forum enforcement projects began in 2008. The scope of the REACH-EN-FORCE-I project was to verify compliance by manufacturers and importers of substances with the REACH obligations for pre-registration and safety data sheets. The REACH-EN-FORCE-II project goes further, focusing on downstream users and formulators. REACH-EN-FORCE-III deals with customs and border control.
16. Maximum residue levels are the upper levels of pesticide residues legally permitted in or on food and feed of plant and animal origin, as set by Regulation (EC) No. 2005/396 to ensure the lowest possible consumer exposure. They are based on good agricultural practices.
17. Over 20 stakeholder organisations, representing business, academia, NGOs, the public, etc. were involved in its elaboration.
18. Each year a two day conference enables representatives of authorities from these countries to share experiences and discuss presentations by experts.
19. The anthroposphere is the part of the environment that is made or modified by humans for human activities and human habitats.
20. UNECE Convention on Long-range Transboundary Air Pollution and Directive 2001/81/EC on National Emission Ceilings for certain atmospheric pollutants.
21. From 1990 to 2010, cadmium emissions decreased by 28% to 1.1 tonnes, mercury by 54% to 1 tonne and lead by 93% to 14.9 tonnes.
22. It is especially difficult to estimate releases to water, since there are hardly any individual data on releases from specific installations or processes. This is due in part to the fact that in some large industrial parks, such as those near Linz and Vienna, several chemical companies use the same treatment facilities for wastewater (Umweltbundesamt, 1999).
23. Concerning emissions to water, analyses using PRTR data are provided in reports based on the EU Water Framework Directive. At national level, Austria's Water Management Plan exploits this data. Trends and analyses of releases to air are provided in the Austrian Air Emission Inventory.
24. Substitution Support Portal: *www.subsport.eu*.
25. For example, between 1990 and 2005, the European chemicals industry cut its energy intensity by 3.6% annually. Absolute GHG emissions, meanwhile, fell by almost 30%.
26. Recycled polymers can be produced by depolymerisation, a process in which the polymers are broken down into their constituent monomers for formation into new polymers.
27. Altstoff Recycling Austria runs nationwide systems for the collection and recovery of household and commercial packaging waste. It was founded in 1993 by the Austrian trade and industry association to execute the Austrian Packaging Ordinance on behalf of the companies affected and to sustain a packaging eco-cycle system.

28. Regulation (EC) No. 850/2004.

29. As chemicals are banned or severely restricted at EU level, the European Commission, rather than individual countries, notifies the convention secretariat of the regulatory actions taken to ban or severely restrict the use of chemicals in Europe, with a view to including the affected chemicals in the list of substances subject to the PIC procedure.

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