POLICY PAPER

ENHANCE SUBSTITUTION AND SUPPORT BETTER CHEMICALS RISK MANAGEMENT

REFLECTION OF THE DISCUSSIONS AT THE INTERNATIONAL SEMINAR: "ENCOURAGE AND SUPPORT ENTERPRISES TO MINIMISE THE USE OF HAZARDOUS SUBSTANCES" ON OCTOBER 23-24, 2018 IN RIGA, LATVIA

Antonia Reihlen, Heidrun Fammler, Eva Becker, Jana Simanovska, Audronė Alijošiutė-Paulauskienė, Julian Schenten, Jens Gercken, Arno Biwer, Oona Freudenthal.

This paper reflects the discussions in the frame of the international seminar and not every participant fully identifies with it. The contents of this publication can in no way be taken to reflect the views of the European Commission.

Funded by:

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

SUMMARY

In the context of three international projects that aim at reducing the use and emissions of hazardous substances, an international seminar took place. Participants discussed the opportunities to motivate and support companies in improving their chemicals risk management and potentially in substituting hazardous substances. Experts of the three projects prepared a background paper before the seminar, a report afterwards and policy recommendations documented separately. This paper summarises the content of background paper and seminar discussions and underpin the policy recommendations.

Legislation and its enforcement are the basis of a company's operations. Bans or use restrictions inevitably end a use and require searching for alternatives, be them of chemical nature or completely different solutions. However, legislation is slow and lags behind scientific knowledge and societal needs. Although the precautionary principle applies in Europe, allowing to regulate chemicals only on the basis of their hazardous properties, limitations exist with regard to an effective, efficient and timely risk management. Consequently, the minimisation of adverse impacts of chemicals cannot be achieved using regulatory measures only.

As legislation cannot sufficiently reduce the risks from hazardous substances, complementary approaches and tools are needed to speed up and intensify related efforts. Market tools may push companies to develop safer products and replace hazardous substances, if the potential market gains are significant in relation to the costs involved in conforming to the tools' conditions.

Management tools for internal company use or at sector, national or global level may promote substitution and improvements in chemicals risk management, depending on the goals set and the instruments and approaches used to implement them and to monitor the progress. Management tools tend to facilitate the implementation of a substitution decision rather than incentivising one. This may reduce substitution or risk management costs/efforts, as management systems (should) ensure that systematic and targeted implementation approaches are chosen, communication and cooperation structures as well as decision criteria (may) exist, leading to efficiency gains as compared to "unstructured substitution activities".

While all tools are self-standing instruments, their effectiveness could be increased by creating synergies through interlinking them in a manner that one enhances the use of another. For example:

- All pieces of relevant legislation could include a dynamic reference to the candidate list established under the EC Regulation on Registration, Evaluation, Authorisation and Restrictions of Chemicals (REACH)[1] and define obligations for these substances of very high concern (SVHCs) regarding use and emissions. Vice versa, substances identified as of concern in other legislation, such as the priority substances under the Water Framework Directive[2], should be considered for inclusion in the REACH candidate list.

[1] EC 1907/2006

[2] 2000/60 EC

Interreg Baltic Sea Region | EUROPEAN REGIONAL DEVELOPMENT FUND | EUROPEAN UNION | EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP | Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

- Integrating “chemicals issues” in quality or environmental management systems could be linked to reward mechanisms in compliance documentation (e.g. emission reporting) or inspection intensity
- Substitution of carcinogenic, mutagenic and/or reprotoxic substances (CMR) at workplaces in any company or institution, where possible, could be included as a criterion in public procurement rules.

The possible interlinks between substitution incentives and facilitators are not yet explored in detail. Implementing such interlinks may boost the use of the tools and hence contribute to a faster and more efficient risk management of hazardous substances, without creating major additional efforts.

The awareness of chemical risks in general influences the “societal and economic climate” and hence the degree to which the use and content of hazardous substances in products is accepted or not. The competences of company staff determines their ability to implement chemicals risk management. Hence, education and training on “green chemistry”, chemicals risk management and product design for chemical safety is needed at all levels of the supply chain and for all positions in companies (purchasers, technicians, product designers, health, safety and environment managers etc.), but also in the authorities. Not only universities, but also public administration or training institutes should revise their curriculae respectively.

Interreg Baltic Sea Region EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects “LIFE Fit for REACH” (LIFE14ENV/LV000174) and “LIFE AskREACH” (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

CONTENTS

Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP
Life
The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

1 INTRODUCTION

The use of chemicals is essential for the production of goods and services of our daily life. Besides chemicals contribute to the development of technologies and products that offer environmental or health benefits and hence contribute to societal well-being and growth. However, if exposure to hazardous substances exceeds certain thresholds, they may cause risks to human health and the environment. The degree of risk depends on the type and severity of a substance's hazards as well as the type, level and duration of exposure. Combined exposure[3] may occur and increase the risk. In addition, other stress factors may decrease the stability and resilience of humans and the environment, influencing the extent of risk and/or damage.

The EU chemicals policy consists of several pieces of legislation, among others REACH, the regulation on classification, labelling, packaging of chemicals (CLP) and the regulations on biocides, pesticides, persistent organic pollutants (POPs), prior informed consents (PIC) and cosmetics. It aims at reducing the (eco-) toxic risks from the use of chemicals by several means, mainly the obligations of:

- substance manufacturers (and partly formulators of mixtures) to generate information on hazards, uses and exposure and make it available to downstream actors and authorities,
- substance manufacturers (and partly formulators of mixtures) to identify their chemicals' uses, estimate potential risks and identify whether and how conditions of safe use can be ensured by themselves and their customers along the supply chain,
- downstream users of chemicals to implement any condition of safe use communicated to them, including safe use of authorised chemicals,
- all actors handling chemicals to comply with any bans, use restrictions or disposal conditions defined in legislation or documents required by legislation, such as safety data sheets.

Additional aims that influence chemicals management at EU and global level are the sustainable development goals (SDGs). They do not only address the (eco) toxic risks, but also societal and economic needs and the increasing pressure for circular material flows and material recycling.

At an international seminar participants discussed the question, if and how authorities, non-governmental organisations (NGOs) and other stakeholders could motivate and support enterprises in phasing out the use of hazardous substances or at least in reducing their use and (better) controlling emissions and exposure. The seminar was organised in the context of three EU-funded projects in which the Baltic Environmental Forum is currently involved:

- The project "Life Fit for REACH" aims at motivating enterprises to substitute substances of very high concern (SVHCs) and to improve their overall chemicals management (http://fitreach.eu/).
- The project "INTERREG NonHazCity" aims at identifying and minimising emission sources of hazardous substances at city level (nonhazcity.eu).

[3] Combined exposure = simultaneous exposure to different substances (= exposure to multiple chemicals by a single route and exposure to multiple chemicals by multiple routes, https://www.sciencedirect.com/science/article/pii/S0273230011000638?via%3Dihub)

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

- The project "Life AskREACH" will establish and implement a smart phone app supporting consumer requests concerning substances of very high concern in articles covered by REACH (https://www.askreach.eu/).

This paper describes some of the core conditions of companies' operations and how they influence their motivation and abilities to substitute hazardous substances. This should highlight potential levers for authorities, NGOs and other stakeholders to enhance substitution. Related instruments, including improvement potentials with a view to chemicals risk management, are outlined. The paper is based on the background document and the discussions at the international seminar and complements the derived policy recommendations.

2 CONDITIONS UNDER WHICH COMPANIES OPERATE

2.1 Infrastructure and supply chains

The inherent interest of companies is to create income from products and services in order to:

- cover the production costs (existence of the company);
- invest in the improvement of current products or the development of new products, e.g. to comply with (new) legal requirements, maintain or increase the products' competitiveness, fulfil supply chain demands etc.;
- expand the production (increase turnover and gains);
- invest in marketing activities, such as strengthening a brand name, promotion of products but also activities to take social responsibility etc.

Some companies may operate only on the EU-market, others may be globally active. The increasing complexity and globalisation of supply chains makes their management challenging and time consuming. This results in certain inertia regarding (voluntary) changes in product design. Different requirements across jurisdictions may trigger multiple customer demands, posing additional challenges to material and product compliance, especially for global players. Finally, product approval procedures[4] or standards may limit the possibilities of changes in design and production.

Infrastructural hindrances to substitution could be for example:

- a (general) lack of (information on) less hazardous alternatives, their availability, suitability for the particular use as well as the economic impacts of their use. This is partly related to a knowledge transfer gap within established supply chains, as suppliers usually do not provide hazardous substances AND alternatives at the same time. Hence, companies wanting to substitute a chemical need to look for new suppliers outside their established supply chains.
- substance manufacturers may operate installations dedicated to very specific products or input materials (e.g. mineral oil refining) and hence are rather inflexible with regard to what and how they produce. Obviously, their willingness and ability to incentivise or promote substitution is low.

[4] This may be the case e.g. for products with particular safety requirements (e. g. aircraft, cars) or with specific requirements to production, e.g. hygienic standards in the food industries.

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

- substance manufacturers operating multi-purpose installations may be in a better position to change products, but still face high uncertainties and costs, due to investments into research and development and potentially changed/new installations and equipment.

Consequently, both, the economic risk of substituting one substance with a less hazardous alternative and the existing production infrastructure, are important factors influencing the readiness of companies/supply chains to substitute. Any activity increasing the size of and certainty about future markets could be a substitution incentive. Similarly, any means to reduce a company's costs or increasing its savings due to a substitution could be an incentive.

2.2 The legal frame and its enforcement

All companies in the EU have to comply with legislation. In general, the legal obligations from occupational safety and health (OSH), from consumer, environmental, waste and installation-related legislation apply to all companies equally, except for the differences built into that legislation, e.g. based on the company size and/or the companies' production capacity[5], type of activity and type of products. Companies need to:

- be aware of which legislation applies to them;
- be aware of and understand the specific requirements that apply to them and to their products as well as to the products of their customers. In addition they have to follow if and how these requirements change over time;
- implement the requirements and document the implementation, including to prove compliance to inspectors and customers.

This requires resources and competences in the companies as well as continuity and patience, in particular where information from the supply chain is needed. Each piece of legislation addresses chemical safety from a different angle. However, there are common grounds regarding the underlying approaches, responsibilities, procedures and activities/tools that (should) support phase-out or use reduction.

While manufacture, import and use of substances and mixtures are almost entirely regulated at EU level, other relevant legislation (environment, OSH, consumers, waste, emissions) exists as EU directives and needs to be transposed into national legislation. This may cause different requirements across the Member States, which adds an additional layer of complexity to the legal frame companies have to comply with.

Enforcement is one of the cornerstones in the implementation of any legal provision. Without a system of enforcement and associated penalties, the legal provisions will soon lose their credibility. The companies' awareness of legislation and associated enforcement can act as an incentive to improve chemicals risk management. This does not mean that a majority of the companies will be subject to inspections, but the possibility exists. Awareness of the existence of enforcement activities will also be

[5] For example the requirements under the Industrial Emissions Directive (IED) apply only to installations of certain sectors or conducting listed activities and partly the coverage of the Directive depends on the production capacity.

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

an incentive for third parties, such as competitors and non-governmental organisations (NGOs), to notify lack of compliance to enforcement bodies.

2.3 Market opportunities and management issues

Companies may have different strategies to maintain and increase their established markets or to enter new ones. Entering new markets may create new costs as compared to maintaining the existing ones, because a change of the product design may be necessary, e.g. to enter markets of "green" products. A strategy of entering new markets will be pursued, if it pays off in the mid-term or at least in the long-term. Market instruments that hinder or facilitate market access and thereby could contribute to pushes and pulls for substitution may be for example:

- requirements by the customers on the composition or the production methods of products;
- criteria that must be fulfilled to promote a product as "healthy" or "environmentally friendly", e.g. via eco-labels;
- additional earnings or cost savings from avoiding the use of hazardous substances.

Companies have different cultures that influence if and how they use tools to support their chemicals risk management. However, supply chains may demand the existence of, e.g., sector-specific (standardised and/or certified) management systems or the use of specific communication tools. Hence, companies are not always fully free in selecting their support tools.

The opportunities of international, national or sectoral cooperation and the benefits from common research, policy implementation and advice from authorities and/or industry associations widely differ across the Member States as well as across sectors. For example, in the textiles industry, which has dealt with chemicals management for a long time, several related initiatives and tools exist. The approaches of the automotive industry are even further developed and implemented via a global ("quasi obligatory") materials management system operated as an IT-tool.[6]

2.4 Awareness and education

The qualification and efficiency of personnel in the technical and economic departments of a company are usually selected based on clear criteria and indicators. However, competences and the necessary resources to implement chemicals management are frequently underestimated. Furthermore, chemicals management tasks are frequently outsourced and companies lack in-house knowledge. There appear to be too few people who are trained in, e.g., chemicals legislation and regulatory chemistry[7], "green chemistry" and product design considering chemical safety. Furthermore, the technical professions like engineers and technicians as well as the economic staff like purchasers or product managers appear to have little knowledge of chemicals in general. Finally, cooperation, communication and experience exchange (on the use of hazardous substances) within companies may be hindered, for example by resource constraints, ignorance of responsibilities and knowledge of

[6] International material data management system (IMDS).

[7] I.e. potential staff is not sufficiently well educated about the (multiple) chemicals requirements or it is not well trained in e.g. understanding what tasks are necessary to fulfil legal requirements like hazard classification, interpretation of toxicological testing etc.

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

colleagues or differing management priorities. All these factors are barriers to successful substitution of hazardous substances in companies and supply chains.

3 HOW CAN LEGISLATION SUPPORT SUBSTITUTION?

Due to the large variety of relevant legal requirements, the following chapters only introduce main regulatory mechanisms and instruments with a view to their potential to stimulate substitution.

3.1 Regulating market access

The EU legal framework places the responsibility for product safety on the companies. The extent to which authorities check, if the market actors actually take this responsibility, generally depends on the application area of a substance. The application area is closely related to the potential risks: Applications with high exposure potentials are more closely controlled than those with low ones. Approval procedures exist, where authorities check the information and assessments of the market actors, e.g. for food additives, biocides or plant protection products. Some approval criteria exclude certain hazardous properties, such as CMR, persistent/bioaccumulative/toxic and very persistent/very bioaccumulative (PBT/vPvB) in biocides and plant protection products legislation. In general, approval procedures are considered to be in place and sufficiently well-functioning to ensure that no risks occur and that substances causing unacceptable risks do not enter the market. Deducing from the low relevance these procedures had in the discussions of the international seminar they do not appear to be of high priority with a view to enhancing substitution.

In contrast to the approval procedures for biocides and plant protection products (c.f. above), the manufacture and use of substances (in mixtures) used in industrial, professional and consumer uses and products “is not subject to an authority approval. Here, the EU chemicals legislation REACH require compilation and partly also safety assessments prior to manufacture and use and an evaluation of that information is undertaken only in some cases.

Finally even less requirements exist for consumer articles with regard to the placing on the market of hazardous substances contained therein. Some restrictions exist as well as sector specific non-legal requirements, such as product standards and norms may exist, including provisions for safety assessments and communicate of their results.

Information on the hazardous properties of so called industrial chemicals[8] must be provided according to REACH. However, there is considerable criticism on the information quality and a request for stronger and more intensive enforcement by the European Chemicals Agency (ECHA) and the Member States. This should ensure the availability of reliable information to compare potential alternatives and to avoid regrettable substitution. Overall, registration and data availability are a priority area to foster substitution, but appear to be taken care of at EU level already.

[8] Substances used in the production of mixtures intended for industrial, professional and consumer use as well as the production of articles and which are not covered by other chemicals legislation, i.e. which are not an active substance in biocides, pharmaceuticals etc.

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects “LIFE Fit for REACH” (LIFE14ENV/LV000174) and “LIFE AskREACH” (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

Classification and labelling is the "universal language" to identify and communicate chemical hazards. The properties of very high concern, mainly CMR, PBT/vPvB and endocrine disruption, appear to be generally accepted as indicating a strong need for substitution. It is widely undoubted that classification indicates which hazards/substances to avoid. Also the usefulness (and overall functioning) of the classification and labelling system is not questioned fundamentally and, hence not an area for significant improvement regarding substitution.

3.2 Regulating Use

Two types of regulating the use of (hazardous) substances can be distinguished:

- prohibition/ban of all uses with the possibility of exempting particular uses directly (e.g. POPs regulation) or upon request (e.g. REACH authorisation) or
- restricting a particular substance use, making it subject to conditions (e.g. REACH Annex XVII or Toy Safety Directive).

These regulatory instruments cause a strong regulatory push, as compliance can only be reached by using an alternative, unless a use is exempted or authorised. Use limitations are based on the authorities' initiative and assessment of hazard and risk and need enforcement to enhance compliance. Among the significant deficits of these instruments are the lack of a systematic and consistent approach for use restrictions, a hesitation to use grouping approaches, a lack of coverage of imported articles (REACH authorisation) and the high resource needs of authorities to develop restriction proposals.

3.3 Regulating exposure

Legislation on (emissions from) installations, on OSH, the environment and partly also on waste include provisions to minimise exposure to hazardous substances in general. In addition, installation and OSH legislation include or refer to (procedures defining) limit values for substances or groups of substances. All these provisions on chemicals in non-chemical legislation may necessitate the implementation of risk management measures in companies, which most likely creates costs. If the hazardous substances were not used, the costs could be reduced or fully avoided. There are several proposals and a general discussion on policy integration from the perspective of reducing burdens and creating synergies. However, from the perspective of promoting substitution, policy integration would mean to ensure consistent requirements (e.g. not allowing the use of a substance in one legislation that is forbidden under another) and consistent methods and decision making in their implementation, also at the level of EU authorities and the Commission itself. Integrating legislation and establishing (additional) links between legislation with regard to (avoidance of) hazardous substances would increase legal pressure for substitution, but also the benefits from substitution.

3.4 Regulatory incentives from legislation

Regulatory incentives for substitution are understood as legal obligations, other than use limiting measures, that are triggered by the manufacture, import or use of a substances (with particular

Interreg Baltic Sea Region EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

hazards) and that require input of human or financial resources. If these obligations can be avoided by replacing the substance(s) triggering the obligation with less hazardous alternatives, the incentive are the saved costs. Examples of such incentives are safety data sheets and labelling provisions, increased documentation requirements for hazardous wastes or communication requirements on SVHCs in articles under REACH Art. 33. Additional regulatory incentives could be, e.g., reduced obligations for substance approval or product authorisations in the absence of (certain) hazards (e.g. "low risk biocides"), the reduced registration requirements according to REACH Annex III for substances expected to have no/low hazard or prolonged revision deadlines for approvals.

The effect of legal incentives on substitution is not evident and may differ depending on a company's role in the supply chain and the type and value of the product. Compared to legal use limitations, the impact of legal incentives on substitution is likely to be much lower. Furthermore, the costs of substitution appear to exceed the savings of avoiding the obligations.

3.5 Information as precondition of chemicals risk management

Chemical risks can only be managed if sufficient information on the content of (hazardous) substances in mixtures, articles and wastes is communicated along supply chains and to the waste sector. Transparency about product composition and a related monitoring of substance flows along supply chains and on the EU market are currently insufficient. This has various reasons, such as:

- the need of resource investment to collect, process and communicate substance information on products (mixtures and articles);
- interruptions of supply chain communication due to a lack of respective legal requirements, in particular for articles and wastes;
- a perception that information is neither needed nor beneficial, as well as a fear to lose confidential business information to competitors;
- a lack of (standardised) data formats to support communication.

While full material declarations[9] would result in the highest resource savings (i.e. no communication would be need after an update of the REACH-candidate list), they may also require the highest efforts to identify, collect and communicate those data. Less extensive information on substances in products may already significantly improve the ability of all actors to take informed decisions.

Communication along the supply chains (including the waste sector) forms the basis of chemicals risk management, including substitution. Many actors regard (global) standards for the exchange of material compliance data, such as in the electronics sector[10], as an important step in improving communication. Consumer rights for information should be strengthened, e.g. regarding product labelling and obligatory answers to information requests according to REACH Art. 33.

[9] Full material declarations would include provisions to protect confidential information, i.e. not result in a 100%

[10] EN 50581:2012

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

3.6 Enforcement

Enforcement is a way to ensure compliance with the legislation and creating a level playing field for all actors. As emphasized also in the REACH review, there are different enforcement systems and resources in the Member States, leading to different approaches and numbers of controls (for instance). Lack of harmonisation and too little resource investments into enforcement has repeatedly been criticised by stakeholders, as well as shortcomings regarding imported goods.

Mechanisms of enforcement that trigger or incentivise substitution may be inspection visits, publishing inspection results and creating public awareness on irregularities in companies as well as imposing sanctions in case of incompliance, which can be of administrative, but also criminal nature.

In addition to controlling compliance with legal obligations, inspectors can provide support to companies by advising on the safe use of chemicals and potential substitution needs, or by providing training and guidance on chemicals risk management. However, as inspectors lack the technical insight into the production processes and products, their possibilities to provide advice are limited.

Strong enforcement significantly increases compliance and credibility of the provisions, raises awareness and increases the competences of companies to implement legislation. Hence, it should be considered to increase the resource input of the Member States into enforcement activities. Furthermore, there is a need for efficient and targeted inspection strategies that focus on controlling "systems" rather than compliance on an "article-by-article" approach.

Clear legislation with defined tasks, obligations and deadlines are a precondition for effective enforcement. Regarding REACH Article 33, this would require changing the obligations so that any information request would need to be answered, also in the absence of SVHCs.

3.7 Conclusions on legislation as substitution driver

The current legislative frame includes strong substitution drivers in the form of mechanisms controlling market access (based on hazard and on risk), which appear to be working sufficiently well. In principle, also marketing and use restrictions as well as the REACH authorisation process are evaluated as strong substitution drivers. However, deficits in their implementation, including inefficiency of procedures and "too easy" access to authorisations, limit their power to foster substitution and hence bear improvement potentials. The more effectively legislation is enforced, the more powerful are the substitution drivers. However, due to resource limitations and the high number or products on the market enforcement can only be a complementary element in the legal system.

The lack of information on the content of hazardous substances in mixtures, articles and also in wastes is a core barrier to substitution. Hence, improving supply chain communication, e.g. by awareness raising, capacity building, (global) communication standards as well as potentially extended legal communication requirements and IT-tools are options that would significantly impact the decision basis for substitution.

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

4 HOW CAN MARKET TOOLS SUPPORT SUBSTITUTION?

Market tools are understood as (economic) approaches and instruments that positively or negatively influence either the demand for products or the costs related to their production and use. In principle, they can promote reducing the use of hazardous substances and/or improving chemicals risk management in two ways:

- punishing the presence of hazardous substances in products, either financially or by decreasing the demand for such products,
- rewarding the absence of hazardous substances in products, either financially or by increasing the demand for such products.

The relation between the expected markets/profits gained or lost and the expected chemicals risk management costs is an indicator for the potential impact of a market tool or measure. Hence, their impact may differ for different types of products/companies. Market related tools may be developed in the EU, at national level or by individual organisations, such as city administrations, NGOs or sector associations.

Market related tools do not prohibit market access or use, but influence the conditions of placing on the market. Hence, they may complement legal obligations on hazardous substances that cause administrative or financial burdens for companies or incentivise substitution, if substances or substance properties are addressed, which are not (yet) regulated.

4.1 Taxes

Taxing the content, use or emissions of hazardous substances appears to be an interesting market tool, in particular as it allows individual EU Member States to influence their own, national markets. On the other hand, taxes may lead to distortions of the European Common Market if implemented only in some Member States which may reduce or even contradict the intended effect of influencing decision making in companies. Some experiences exist with environmental taxes and fees, but the content, use or emissions of hazardous substances are rarely taxed. The current political climate does not favour (any additional) obligations or costs to companies and national governments are unlikely to take unpopular measures, in particular where their effect is hard to predict. There are several unresolved questions related to taxes, the answering of which may contribute to an increased acceptance and use of taxes to steer markets and company behaviour, in particular:

- What should be taxed? Individual substances, substances groups, substance properties?
- How can a tax be designed that is (easily) enforceable and does not require many resources for implementation and control?
- How high would a tax have to be to have a steering effect on the market actors, i.e. actually cause a market push towards substitution?
- How should the income from taxes be used; e.g. does it make sense to invest it in R&D for substitution?

4.2 Green public procurement

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

Green public procurement (GPP) could, via defining conditions (also) on the content of hazardous substances in products and/or regarding the chemicals risk management of suppliers, create a market for safer products and (more) responsible companies. As public purchases have a market share of app. 20%, GPP could be a strong substitution/risk management incentive. However:

- There is frequently little political will to develop, implement and enforce GPP (e.g. little support from the administrations' heads).
- Administrations partly lack awareness, competences and cooperation routines between departments and functions, preventing ambitious procurement guidelines.
- Options to strengthen the role of GPP as a substitution driver could be, e.g.:
  - Development of a step-by step guidance for procurers, including how to set clear criteria, how to establish cooperation in the own institution or to procurers in other administrations;
  - Publication of GPP good practice examples to demonstrate that implementation of GGP not necessarily increases purchasing costs.

Currently, GPP guidelines seldom include criteria on chemicals. If such criteria exist, they are frequently not applied and controlled and hence, the full potential of GPP to promote substitution and better chemicals risk management are not yet fully exploited.

4.3 Product claims, including ecolabels

There are several types of environmental product claims, ranging from self-declarations to ecolabels and environmental product declarations verified by third party. The high number of different labels and declarations weakens the power of each tool, because each of them covers (only) a small market share and consumers are disoriented on their meaning and level of ambition.

Ecolabeling schemes exist at EU and national level, but also at non-governmental organisations, including company associations. They distinguish those products that fulfil the label criteria from its product group. Hence, a product's competitiveness is increased as its positive environmental aspects are clearly indicated. The extent of the market pull of ecolabels depends on their degree of popularity, as this is a proxy of the potential market a product could gain. Some issues that could improve the usefulness of ecolabels as substitution triggers are:

- More guidance for consumers and public procurers is needed regarding which labels exist, who issues the label, what level of ambition they have, including what criteria are defined on the content of hazardous substances in the product, how the criteria are developed and how they can be accessed, by whom the label is controlled, if the labelled products really fulfil the underlying criteria (guidance on reliability of ecolabels).
- Clearer legal requirements and control over false, misleading environmental claims that confuse and distract consumers from reliable ecolabels.
- Publicly run labels, like the EU-flower, the Nordic Swan or the Blue Angel appear to be the most relevant tools to create a market pull for products without or with less hazardous substances. In order to make the labels more attractive, the labelling authorities should (regularly) invest in awareness campaigns of the labels.

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

- The label criteria on hazardous substances could/should be harmonized across different labels. Exclusion of the use of SVHCs included in the candidate list is a necessary starting point (which is already implemented in many labels), but could/should be extended to further substances of concern, thus being more ambitious and pro-active.
- The costs to obtain and maintain a label should be proportionate to the potential market gain and consider that SMEs may be less able to cover them.

4.4 Consumer information

Consumer demand for products without hazardous substances can only emerge if there is a certain level of awareness. Awareness could be raised by respective campaigns. In addition, practical information tools that are easy to use and understand may contribute to overall awareness. While there is no consensus among civil society organisations on the type and level of detail of information consumers should be provided with, there is agreement that transparency is a pre-condition for informed purchasing decisions. Among the consumer awareness tools, smart phone apps seem to be a modern and quick solution for providing information on chemicals in products. A number of apps is available, mostly run by public authorities or consumer organisations.

The planned consumer app under AskREACH aims at supporting information transfer on SVHCs in articles from the article provider to the consumers according to REACH Art. 33 (2). It requires that the communication along the supply chain works well and makes that information available. During the app's current development, several challenges were identified, which partly also apply to other, similar tools, among others:

- The development and maintenance of the app and the underlying data on hazardous substances are resource intensive and require continuous updating.
- Apps of this kind will only create an impact on the markets as (information on) SVHCs in articles would become a quality criterion for consumers. However, this needs continuous requesting by consumers and showing that there is a demand for SVHC free articles.
- It should be considered if and how information (tools) on hazardous substances in products can be integrated into one tool and/or interlinked with existing or future databases, e.g. the future ECHA database on SVHCs in articles intended to inform the waste sector.

4.5 Conclusions on market tools as substitution drivers

Market tools can pull and push markets by influencing either the demand for or the costs of products. Although taxes appear an attractive national tool, they are hardly used due to, among others, unresolved questions on approaches for an effective and efficient implementation as well as a lack of political climate for (additional) burdens to companies. The power of market tools that influence product demands, like ecolabels, procurement criteria and/or consumer information tools depend not only on the strictness of the criteria (on hazardous substances), but also awareness level on demand side, the costs and efforts to meet them as well as the expectations of a potential future market.

Interreg Baltic Sea Region EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

5 HOW CAN MANAGEMENT TOOLS SUPPORT SUBSTITUTION?

Management tools are rules, procedures and/or IT-tools that support the organisation of work and decision making in companies and organisations and/or between organisations. They could focus on ensuring legal compliance, reacting to market or supply chain demands or on addressing specific aspects, such as communications. Normally, management tools define tasks and responsibilities, provide rules for implementing tasks and indicators to confirm implementation. In principle, management tools could integrate provisions on the use of hazardous substances. In particular the management goals ('policy level') should reflect ambitions on the phase-out and use reduction of hazardous substances. Up to now, only few management tools explicitly or implicitly address hazardous substances and/or include guidance and methodologies for chemicals risk management.

5.1 EMAS/ISO management

The environmental management standards such as EMAS and ISO[11] 14,001 should help organisations to minimise the negative environmental impacts of their operations. They prescribe what environmental impacts to address in which manner, and how to monitor progress. Both programmes require third party certification, however EMAS is more ambitious than ISO 14.0001 with regard to environmental review, proof of full legal compliance and influence over suppliers[12]. Currently, none of the standards includes specific provisions to include chemicals risk management into the system, and guidance documents do not give respective information. Therefore their inclusion depends on awareness level and the willingness of the company and respective auditor.

Addressing chemicals in (environmental) management systems could trigger substitution, but is more likely to support the decision making and documentation process of substitution. To strengthen chemicals aspects in environmental management systems, the following should be considered:

- Inclusion of a separate chapter on "chemicals risk management" into the management standards (as annexes) or related guidelines with explanation and tools to control risks and implement a hazardous chemicals policy in the company;
- Inclusion of chemicals aspects in sectoral reference documents, which must be considered if EMAS is implemented, as well as stronger consideration in Best Available Techniques Reference Documents (BREFs);
- Integrating chemicals management in the certification/registration system and criteria;
- Including risk assessments (quantified description of the risk) rather than risk determinations (qualitative risk identification) in the management guidance as well as promoting lifecycle cost analysis to counteract simple considerations on prices.

5.2 Voluntary industry initiatives and corporate social responsibility

[11] EMAS: Eco-management and auditing scheme. ISO: International Organization for Standardization

[12] http://ec.europa.eu/environment/emas/pdf/factsheets/EMASiso14001_high.pdf

Interreg Baltic Sea Region | EUROPEAN REGIONAL DEVELOPMENT FUND | EUROPEAN UNION | EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP | Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

Voluntary industry initiatives that focus on chemical risk management and substitution or at least include aspects thereof, address sector specific questions and include the development of approaches and tools to tackle them. There are broad ones that can be considered as "Corporate Social Responsibility" (CSR) programmes at sector/industry level or narrow ones implemented along individual supply chains, companies or associations. Industry initiatives may include social, environmental, ethical, consumer, and human rights concerns into business strategies and operations that go beyond the legal requirements.

The topics and levels of ambition in voluntary industry initiatives depend on the (collective) priorities and available resources. They could provide guidance and support in particular to small and medium-sized enterprises (SMEs). However, most programs seem to be designed by and for large companies. Some critical aspects with a view to supporting substitution are that voluntary industry initiatives:

- Are perceived as little ambitious and are frequently not trusted by civil society, because indicators and transparency (e.g. reporting or external audits) about the success of the initiative are missing;
- Usually do not address and support those companies that lag behind the most, but those, which are already aware and front-running;
- The initiatives are often not well known and the benefits of joining them are not obvious.

5.3 Supply chain management tools

Transparency on the content of hazardous substances in products (mixtures and articles) is a central precondition for chemicals risk management. Supply chain tools should support the exchange, storage and processing of information on hazardous substances in products. At present, several IT solutions are available to technically support information management along supply chains. However, a lack of awareness, missing information from exporters of articles, lack of willingness to provide information, partly due to confidentiality concerns and partly due to resource implications, are among the most important reasons for the malfunctioning of supply chain communication and the non-use of tools. Furthermore, many market actors disregard benefits of increased transparency. Consequently, to improve transparency on chemicals in products it is essential to:

- Raise the awareness level on the needs and benefits of supply chain communication, including disclosure of material compositions unless confidential information is concerned;
- Develop (global) information provision standards in order to ensure compatibility of approaches and tools and minimise the communication efforts;
- Strengthen market forces that request hazardous substances information, including the consumer right to know according to REACH Art. 33;
- Specific support may be necessary for SMEs as well as for sectors/supply chains without strong market actors who could, via their purchasing powers, foster the implementation of communication systems;
- Synergies in product design with a particular view to the circular economy and detoxification of material streams need to be explored.

Interreg Baltic Sea Region EUROPEAN REGIONAL DEVELOPMENT FUND EUROPEAN UNION EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

5.4 Global, regional or national initiatives

Global, regional or national initiatives aimed to reduce the negative impacts of chemicals are, e.g., the global initiative "Strategic Approach on International Chemicals Management" (SAICM) or the Swedish national plan for a non-toxic environment. They are detailed into "action plans" that include specific measures and indicators of success. Global, regional or national initiatives are initiated by governments/authorities with the aim of providing transparency and orientation regarding the goals in chemicals risk management, aligning work by various actors and supporting cooperation.

Such initiatives are frequently developed in a consensus oriented manner and involve several actors with potentially different interests and perspectives on an issue. Hence, the initiatives may represent the common denominator of all actors and not be very ambitious. However, as they aim to paint "a bigger picture" and usually include indicators to measure success, they can be effective in achieving their goals and have a high level of (public) acceptance.

6 INTERLINKING OF TOOLS

Each of the above mentioned measures form part of the frame within which companies operate. In each area (legislation, enforcement, market and management) different tools exist that could support substitution and chemicals risk management. It is logical that interlinking the different tools with regard to the use or avoidance of hazardous substances would create additional substitution incentives and implementation synergies on all sides.

Policy integration at the level of legal texts and annexes would be an option to strengthen the push from legislation, e.g. including dynamic links from all relevant legislation to the REACH candidate list or including triggers for measures under REACH, if environmental quality standards of the Water Framework Directive are not met. Furthermore, there may be options to enhance the regulatory push for substitution by reviewing how the obligations are implemented, including, e.g., decision criteria on restrictions or authorisations under REACH or the relevance of end-of-life considerations in product approvals. In addition to the legal framework, also other tools should be related to legislation or among themselves so that they strengthen each other. It could be considered for example to:

- Reward the implementation of chemical aspects in environmental management systems by reducing fees for installation permits;
- Supporting participation in voluntary initiatives on chemicals risk management, by making this a criterion in public procurement rules
- Using reliable, strong ecolabels as criterion in public procurement
- Including (additional) information on a company's chemical policy in tools for consumers, e.g. apps to request Art. 33 information.

Any type of reinforcing interlinkage would be beneficial to achieve a faster and more effective substitution. Therefore, further work to explore related opportunities is recommended. Furthermore, a platform introducing and bringing together all "tools" and related actors could facilitate cooperation and communication on hazardous substances and how to manage them.

Interreg Baltic Sea Region EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

7 CONCLUSIONS

There are ample opportunities how authorities and other stakeholders could motivate and support companies in substituting hazardous substances.

Compliance with legislation is a precondition of a company's operation. The application of legal instruments that limit the market of hazardous substances in a stringent way is an effective, but cumbersome way of initiating substitution. Other obligations on hazardous substances cause administrative and/or financial burdens that can be substitution incentives, because avoiding hazardous substances would save these costs.

Enforcement is an important mechanism to increase compliance with and credibility of legal provisions. In addition and due to direct contacts, inspectors can provide companies with information and support, including to identify substitution needs and search for less hazardous alternatives. Hence, enforcement enhances the effects of legislation, but also may provide motivation and support to companies.

Market tools may create incentives for substitution by making the use of hazardous substances either more expensive than substitution with a less hazardous alternative or by facilitating access to new/extended markets that would counterbalance the substitution costs. Currently, few market tools explicitly address hazardous substances and they are neither widely nor intensely implemented. Here, the design of the tools, their criteria and their economic implications should be assessed and made more stringent, if substitution should be promoted.

Management tools cover a range of programmes, initiatives, tools and standards that could rather support the decision making on and implementation of substitution than being a strong incentive to substitute as such. However, environmental management systems or corporate social responsibility initiatives usually neither explicitly nor implicitly address hazardous substances and/or provide methods and guidance on how to improve chemicals risk management. Also here, a thorough review of the approaches and guidelines of management tools with a focus on integrating chemicals aspects would support substitution in general.

While all these conditions that frame a company's operation may contribute to fostering substitution, significant levers are expected in more and stronger interlinking them. The use of one tool could be a pre-condition for another tool or awarded as part of the application of another tool. Which interlinks could be created and how, requires further exploring of the framework of tools.

In any case the general awareness on chemical risk needs to increase in order to create a climate of and demand for "toxic-free products". Furthermore, education and training on sustainable chemistry, "non-toxic product design" and/or chemicals legislation not only for chemists, but any profession involved in the production, placing on the market, purchase and use of mixtures and articles is needed.

Interreg Baltic Sea Region EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union

8 ABBREVIATIONS

BREF	Best available techniques REFerence Document
CLP	Classification, Labelling and Packaging
CMR	Carcinogenic, Mutagenic, Reprotoxic Substance
CSR	Corporate Social Responsiblity
ECHA	European Chemicals Agency
EMAS	Environmental Management Auditing Scheme
EN	European Norm
EU	European Union
GPP	Green Public Procurement
IMDS	International Material Data System
ISO	International Standardisation Organisation
IT	Information Technologies
NGO	Non-Governmental Organisation
OSH	Occupational Health and Safety
PBT	Persistent Bioaccumulative and Toxic Substance
PIC	Prior Informed Consent
POP	Persistent Organic Pollutant
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
SAICM	Strategic Approach to International Chemicals Management
SDG	Sustainable Development Goal
SME	Small and Medium-Sized Enterprise
SVHC	Substance of Very High Concern
vPvB	Very Persistent, Very Bioaccumulative Substance

Interreg Baltic Sea Region EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP Life

The projects "LIFE Fit for REACH" (LIFE14ENV/LV000174) and "LIFE AskREACH" (LIFE16 GIE/DE/000738) are co-financed by the LIFE Programme of the European Union