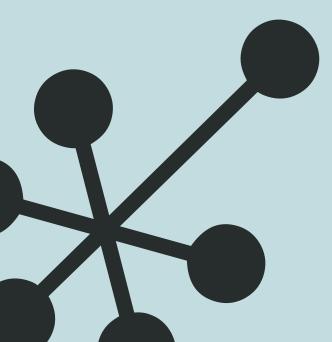
LIFE/FIT FOR REACH

Layman's report

Baltic pilot cases on reduction of emissions by substitution of hazardous chemicals and resource efficiency









Valsts reģionālās attīstības aģentūra



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Layman's report

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LIFE Fit for REACH: 5 years – 15 project partners more than 70 companies

Introduction



Heidrun Fammler, Project Manager

The LIFE project called Fit for REACH was implemented from 1 October 2015 until 31 December 2020. The project was co-funded

by the European Environmental programme LIFE, the governments of Estonia, Latvia and Lithuania, and the 15 project partners.

Its overall objective was to support industry and businesses in the Baltic States in better implementation of the REACH Regulation. The project sought to increase awareness and competency for as many companies as possible within five years, by providing trainings and disseminating information on a variety of concrete substitution measures. It was a huge task! At the end of the project we can say: we do have many substitution successes, we also have successes in reduction of uses of certain hazardous substances and, in particular, we paved the road for mind setting to enable companies in the region to act independently after the conclusion of the project.

Such a comprehensive and large project creates a lot of reports, publications and information materials – many pages with complicated issues difficult to understand for non-specialists in the field. Here, in this report, we are trying to pin-point the most interesting features of the project in a few pages that is both pithy and easy to read. We let our key experts speak to you.

We hope you will find it interesting and will want to read more. Please see the full set of project publications on our website www.fitreach.eu.

Demonstrating to industry that substitution matters

Project pilot companies

and their substitution cases

Six Baltic businesses from four different industries were involved in the project from its very start. Nearly all of them are among the market leaders in their particular sectors.

They joined the project with rather ambitious aims to reduce the emissions of the hazardous substances they used. Each company worked independently, as the production processes and substances used varied greatly from company to company. Some substitution initiatives spanned the duration of the project for finding the most suitable alternative to be integrated into production.



Juhan Ruut, Leading Environmental Expert

Adhering to the myriad chemical, environmental and market-specific legislation is certainly one

of the chief drivers for substitution of hazardous substances. Yet, complementary to that is a company's corporate culture where capitalizing on the value of developing sustainable products that are both safer for people and the environment is also good for business. The knock-on effect this can have in a supply-chain is, indeed, contingent upon a company's place on that chain. But this project has seen that both raw material suppliers and product manufacturers have the ability to influence the demand for safer chemicals if invested with such an interest.

What they did

Tenachem One of the leading Latvian producers for professional construction chemicals set out to substitute phthalates as concerns continue to grow regarding their potential long-term effects. In addition they replaced the mutagenic tin compound with less hazardous alternative.

Tens of recipes were tested at laboratory level, with some upscaled to production of test batches. The best candidate recipe was produced and sent for testing and certification at an external laboratory. Substitution of phthalates opened up possibilities for Tenachem to move into more sustainable product markets. The substitution of the organotin compound reduced the turnover of mutagenic substances in the company and their occurrence in products.





VIDEO 🕨

Epokate The Estonian company produces two-component epoxy resin materials for floor coverings. They successfully substituted the reprotoxic nonylphenol in its products, and developed a benzyl alcohol-free product line. The project gave an opportunity to Epokate to carry out their product development much more efficiently and quickly, and to acquire new equipment for both the laboratory and production levels that are suitable for new products.







Mayeri Industries An Estonian producer of detergents and car chemicals significantly reduced the quantity of four hazardous components from their products: sodium perborate, sodium percarbonate, ethanol and monoethylene glycol. For instance, perborate was completely removed, percarbonate was reduced by the addition of enzymes and soda ash, and a new bile enzyme-based stain remover was developed. As a result, the amount of hazardous substances used in the company, and consequently their release into the environment have also been reduced. Additionally, consumer satisfaction and the working environment of employees has also improved.



VIDEO 🕨

Henkel Balti Oü In order to protect employees, Estonian manufacturer of polyure thane construction foams tested eight alternatives in a laboratory in search for substances safe for human health. The two most efficient of these were tested on the plant's equipment. The use of an alternative cleaning agent minimized workers' exposure, reduced the amounts of hazardous waste, and lowered air emissions. Introduction of an additional quality control measure - infrared spectroscopy – helped the company to reduce wastes due to better options to steer the production process, thus increasing the production efficiency.







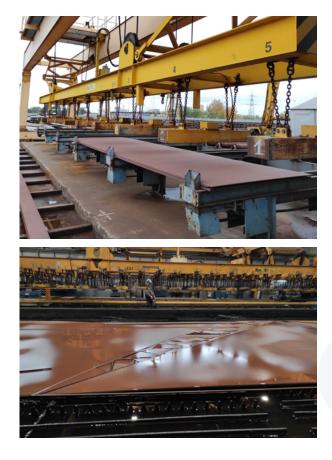
Marijampoles Pieno Konservai

The largest canned milk product manufacturer in the Baltics was determined to completely phase out the use of a Bisphenol A (BPA) based epoxy resin that contained residual BPA. After numerous trials, the company found suitable alternatives for each application that were technically and economically feasible, and which removed the risk of consumer and environmental exposure to BPA. In addition, they aimed to reduce the exposure of workers to volatile organic compounds in the manufacturing processes and invested in new technological equipment for their milk processing line. This improved manufacturing and resource use efficiency.



Vakaru Metalgama A Lithuanian company, whose products are intended mostly for ship building and repair, sought to reduce emissions of volatile organic compounds and to eliminate substances toxic to reproduction. They tested a few alternatives for their technological suitability, as there are high quality demands originating from the specifics of the shipping sector. Although new hazardous substances were introduced by the chosen alternatives, the assessments showed that risk to human health had been reduced and the overall negative environmental impact decreased.

VIDEO 🕨



Every company can do it

Effective substitution in

various enterprises around the Baltics

It is thought that hazardous substances are only found in big chemical factories, but in fact many harmful chemicals are used on a daily basis also by small enterprises. They usually cannot afford to introduce the appropriate chemical management methods, or implement complicated substitution activities. In that way, the project helped more than 70 companies of different scales to improve their work with chemicals by giving expert advice on chemical management. Additionally, they received monetary support for eliminating or reducing the use of hazardous substances.



Justė Kukučionė, Chemical Expert

One of the most important aspects leading to successful substitution or the implementation of chemical risk management measures is commitment

by top management. However, a common barrier observed in the shift to environmentally-friendly alternatives was a lack of their availability. In addition, mandatory technical requirements in an industry may prevent the use of an alternative as well as the need to invest into new equipment. These potential barriers can exacerbate the frustration of a company, in particular if not familiar with chemical management. Nevertheless, many examples from the project show that also small and even micro sized companies can successfully substitute hazards substances.

What we did

Tools for better chemicals management

The work with the companies showed that sometimes even elementary chemical management issues, like chemicals inventory, are problematic. Therefore, simple tools were elaborated by the project and were made available on the project website.

Example template for keepinga chemicals inventory

homepage fitreach.eu provides an idea of the type of information that should be collected and available about the chemicals used in the company.

2. Checklist for the safety data sheet chomepage fitreach.eu allows to evaluate the quality of these important documents used to manage chemicals.

3 A special tool developed by the German Environment Agency (UBA) was adapted into national languages to encourage companies to start substitution processes and help them with the search for alternatives. SubSelect A homepage fitreach.eu is an MS Access-based, free tool that supports comparing hazardous substances and mixtures at screening level with regard to their toxicity, but also their sustainability.

Guidance on the Application of the CLP Criteria are translated into Latvian, Lithuanian and Estonian to help local companies understand the CLP regulation and to provide guidance on how to select the most relevant information for the classification and labelling of mixtures.

Consultations on chemicals management issues

More than 80 companies in Latvia, Lithuania and Estonia received consultations from the project experts on different chemicals management topics. They also received expert assistance to improve different chemicals management documentation, such as with chemicals inventory or safety data sheets. The knowledge gained during the cooperation will allow enterprises not only to purchase, store, and use hazardous chemicals in more organized and better-established systems, but also to ensure safer working environments for their employees.

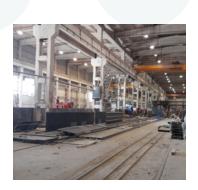


The project cooperated with **Toyota car service** shops in all three Baltic countries where they were introduced to the REACH requirements. They were advised how to improve their chemicals management (keeping the inventory of chemicals), as well as ways to reduce risks.

EXAMPLES



With the project support, **Riga** central market was able to evaluate possibilities and potential alternatives to replace a mixture used in its freezing system that had a very high global warming potential.



An Estonian construction company, **TMB Element**, during three years of systematic work building its chemicals safety system, established an inventory, revised chemicals use, and improved safety datasheets to enter Nordic markets.

Resource efficiency

Sometimes it is problematic to entirely exclude hazardous substances from the work processes due to a lack of safer alternatives, financial barriers, or other obstacles. The project helped six companies better their resource efficiency through minimizing their use of hazardous substances, or by reuse of those substances.

EXAMPLE



A small Latvian metal processing company, **KnK Mefab**, reduced its hazardous substance use in coatings by recirculating paints. As technologically and financially acceptable alternative paints are

unavailable on the market, a technological solution of paint collection and a recirculation unit was chosen.

Substitution of chemicals, mixtures

The project helped almost 40 Baltic companies to substitute problematic substances or to change the chemicals used in their mixtures. It allowed the substitution of significant amount of different hazardous substances with safer alternatives. Among them were substances of very high concern and carcinogens. Substitutions tackled all stages of production – from maintenance of the production line to the final consumer product.



Naujoji Ringuva, the largest manufacturer of hygiene and cleaning products in Lithuania, replaced some aggressive preservatives, fragrances and other unwanted components with safer ingredient options in some of their production lines.

EXAMPLES



The Latvian company **KVIST** is a producer of high-quality design furniture. The company aimed to reduce emissions of volatile organic compounds in production processes as well as in ready products. Despite the longer drying period, the company chose water-based paints as they are more environmentally and human health friendly.



Very small companies, like Lithuanian jewellery studio **Varva,** are also successfully abandoning hazardous substances. This jeweller had been working with several toxic chemicals. However, alternatives were tested, successfully adapted, and perfectly met the production requirements.

Substitution by changing technologies

Substitution or elimination of hazardous chemicals can, likewise, be implemented by changing the technologies of the production. With the support of the project more than ten Baltic companies within the textile, metal processing, car repair and food processing sectors were able to reduce or totally exclude harmful substances by introducing new technologies or by introducing technologies that use safer alternatives.



Estonian electronics producer Scanfil had been marking its cables using an ink printer that used toluene- and butanonecontaining ink. The ink printer was replaced by a thermal transfer printer using two polymers which are not classified as hazardous.

EXAMPLES



A new technology to repair car clutches was installed in the car repair shop **Proring** in Latvia. This enabled eliminating the use of hazardous mixtures which included boric acid – a substance of very high concern.



Lithuanian meat processing company **Utenos mesa** was looking for advanced cleaning and disinfection methods instead of using chemicals that were hazardous to human health and the environment. The company, thus, purchased plasma disinfection equipment suitable for air and surface decontamination.

Green is not just a colour!

Greening industry - greening

procurement - greening consumption

Being "green" is becoming the new normal for companies. Do companies really know how to communicate their environmental performance? Do they know how to convincingly convey green claims that are credible and reflect a genuine benefit to the environment? Do people understand the difference between "green" and "greenwashing"? The project was two-pronged: it worked with companies to understand the motivation and activities on their environmental performance and it provided trainings and material to enhance it. Concurrently, the public was involved through ongoing dialogue about various aspects and process for "greening industries".



Jana Simanovska, Environmental Scientist

Strengthening the internal organization is pivotal in building a culture committed to green procurement within a

company. We have seen improvements when health and environmental managers are made part of the procurement process to train and advise on the purchasing of chemicals. Additionally, a company's move to greener procurement is partly a natural consequence of good legislation that mandates standards that would see safer materials used in products. It's in a company's interest to provide products that are of good quality and in accordance with the rules. But legislation cannot be absent of mechanisms in place for preventing greenwashing on the market.

What we did

Study on the Environmental Responsibility

of Small and Medium Enterprises



The main motivators for substituting hazardous substances on scale from 1-10

A study of almost 300 small- and medium-sized Baltic enterprises has shown that legal obligations, as well as concerns for the environment and workers health are main motivators for businesses to substitute hazardous substances in their products and production processes. Companies acknowledged that expertise was as important an obstacle for substitution as commercial factors. While micro- and small-sized companies were less likely to view themselves as environmentally responsible than medium sized companies, almost half of all companies still recognized the current profitability of being environmentally sustainable. Many more believe that that profitability will increase over time.

Beginners guide to green procurement for enterprises **PDF**

With the assistance of this guide, companies can evaluate their current practice of procuring chemicals and raw materials containing hazardous substances. If deciding to develop a new procurement system or to improve the existing one, the brochure provides useful recommendations and examples. This includes an explanatory introduction and an Excel tool with checklists and examples for ameliorating an internal management system.

Use of environmental claims: best practice guide



Illustration from the guide showing positive and misleading claims

This guide was developed specially for companies to focus on developing clear and substantiated self-declared environmental claims, while avoiding misleading information. Additionally, it introduces the various types of environmental claims: ecolabel schemes and environmental product declarations.



Social dialogue

Participation in festivals, exhibitions, conferences, popular radio and TV programs were some of the ways the project attempted to stimulate discussion regarding green claims and greening industry. The project experts highlighted the importance



of trustworthy eco-labels as indicators of the environmental and health friendliness of a product. They also reflect a company's commitment to improving their environmental performance through their dedicated resources and time.



Meeting and educating companies

In order to raise awareness among companies on green procurement, green claims, eco-labels and their proper use, the mentioned issues were integrated into the agenda of most meetings with companies and chemicals management seminars.





Anchoring the project with Baltic stakeholders

Dissemination – cooperation - dialogue

Cooperation with different stakeholder groups was integral to the success of the project. This is not only evident from the project team consisting of NGOs, companies, authorities, universities and private research organisations, but also from the participation of various stakeholders in the discussion throughout the project. During roundtable meetings and international events, our experts discussed different issues tackled by the project with around 400 representatives from the business sector, supervisory institutions, as well as national and international state and non-governmental organizations. Details of the outcomes from international events are summarized in special reports published on the project website.



Heli Nõmmsalu, Chemical Expert

The project's reach extended to companies that were not even aware they had issues with hazardous substances. This breadth is testament to the interest

of Baltic small and medium-sized enterprises (SMEs) to increase their capacity in chemicals management. The biggest take away for the project team has been the need for ongoing and consistent knowledge exchange of best practices and practical implementation of chemicals legislation. Support through trainings and consultations by those specializing in the field is one of the principal needs for companies, particularly downstream users, if seeking an elevated general awareness of chemicals risk management.

From roundtables to comprehensive recommendations

Working closely with companies in the field of chemicals management contributed to important conclusions that affect the work of national policymakers and enforcement authorities. Therefore, twelve national and three international events were dedicated to engaging with decisionmakers and competent authorities on various aspects of REACH implementation, such as substitution and risk management measures. Dialogue resulted in the shared conclusion that chemicals risks management is a challenge for companies. Basic awareness and competences, as well as structured management systems are missing in many Baltic companies. Nevertheless, progress is possible with several ongoing activities to continue to improve these areas.

After five years of the project, the project experts have formulated comprehensive policy recommendations on legal compliance, and for the implementation of and competencies in chemicals risk management. Policymakers should consider implementing more and continuous awareness raising campaigns for companies. They should develop more efficient and comprehensive enforcement strategies, and increase their resources to implement them.

Establishing substitution funds and respective support networks, as well as empowering SMEs through trainings and workshops will be important to foster substitution in the future. The document outlining these recommendations is available on our project website.

From detailed substitution examples to joint events



The project team organized seminars and trainings for more than 3000 company representatives to encorage substitution and improved chemicals risk management. Implemented cases were partly published to inspire other companies with good examples. Some trainings were organized in collaboration with trade associations to magnify the project reach to a wider audience.

To share the project's experience on the implementation of substitution within businesses



around Europe, several substitution cases will be described in detail and published on the international substitution support portal Subsportplus. This further complements the work we have done in advocating to companies to intensify their substitution of hazardous substances for safer alternatives.

From international events to scientific articles



Our project is one of the few that directly supported companies in the substitution of hazardous substances. For this reason, it was important to share our experience on the international level with projects that focused on chemicals, such as LIFE AskREACH, NonHazCity, as well as with organizations from other countries, such as ALHem in Serbia and the Polish Forum ISO 14000.

Additionally, two international seminars were organized to discuss how to encourage and support enterprises in minimizing the use of hazardous substances and one on indicators how to measure improvement in chemicals management. Conclusions and recommendations from those events are summarized in the special documents and are available on the project website:

- Policy paper: enhance substitution and support better chemicals risk management PDF
- Snapshot: Enforcement of and support action on REACH at Member State level ₽DF
- Seminar on indicators to measure improvement in chemicals management PDF
 Inspired by the activities and achievements of the project, our expert teams developed and published five scientific articles home page fitreach.eu about the substitution of hazardous substances both generally and within particular fields.

Benefits for companies, the environment, and society

Assessing environmental and socio-economic

impacts of substitution

The core of the project aimed to reduce potential damage to workers, consumers and the environment by reducing the use and emissions of hazardous substances. Many substitutions were implemented, but how much better is the alternative and what quantified benefit was achieved for health, environment, and society?

The project team assessed the impacts of the substitution cases in the pilot companies by comparing the likelihood of damage (change in chemical risk) before and after the substitution. Other negative environmental impacts were compared by evaluating their contribution to greenhouse gas emissions, and through the use of a method called life cycle assessment (LCA). The identified impacts were then put into context of the Baltic societies and extrapolated to the national and international level.

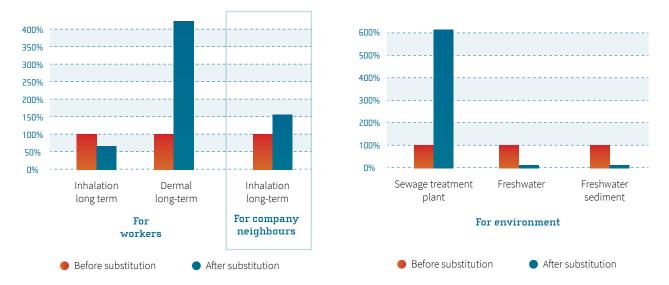
Assessing environmental impacts



Jolita Kruopienė, Professor, Senior Researcher at the Institute of Environmental Engineering

We are very sure that almost all substitutions

decreased the chemical risks and many of them also resulted in reduced environmental impacts. Yet, it proved extremely difficult to assess the changes achieved through substitution because basic data on chemical hazards and properties were missing, as well as information on the lifecycle impacts of individual substances. At the start of the project we chose to use a method that we hoped would be applicable to companies so that they could use it to assess different alternatives BEFORE implementing a substitution. However, we cannot recommend it in practice. This clearly shows the need for practical approaches, in particular to compare the benefits and drawbacks of chemical mixtures.



Example of changes in risk characterisation ratios (RCR) for workers, company neighbours, and the environment resulting from substitution of methylene chloride by Henkel

Human health and the environment are damaged by chemicals if they are exposed to a "critical amount" (exposure level). As the substances used in the companies were used and emitted in small amounts, no immediate damage was caused that could be measured. Therefore, the project experts measured the "risk", which is an expression of how close the dose is to causing damage.

The idea was to quantify the following types of risks of damage to:

- Workers' health by inhaling substances for a
 - long time
 - short time
- Workers' health by having substances on the skin over the
 - long-term
 - short-term
- Consumers if they take up substances for a longer time by
 - inhalation
 - ingestion
 - skin contact

- The environmental compartments
 - sewage treatment plant (STP)
 - surface water
 - sediments in surface waters
- Neighbours of a company by inhaling the emissions that reach their homes

In most cases only some of the above listed values could be determined.

By comparing the values before and after the substitution, an indication was obtained if, and to which extent, the risk was reduced. The following figure shows how this looked.

The lifecycle assessment (LCA) compiles information on all resources needed to produce a particular product or carry out a task. Resources can be materials, but also water, energy etc. A computer programme was used to calculate the impacts from the processes with the hazardous substance before and after the substitution and derived the impacts associated with the process or product for both situations. Environmental impacts are, for example, the contribution to climate change, the contribution to ozone depletion, the use of land necessary to provide all resources for the process, but also marine eutrophication or human toxicity. As a result of the comparison, it can be seen if the substitution causes higher or lower impacts on the environment.

Changes in use and emissions of substances were estimated, paying particular attention to substances of very high concern (SVHC), other carcinogenic, mutagenic and reprotoxic (CMR). As a result of the activities implemented by the pilot companies, the reduction of e.g. SVHCs is almost 290,000 kg. Of these, the majority have CMR properties and almost 500 kg are also endocrine disruptors.

Taking into account the results of LCA and changes in risk characterisation ratios (where it was possible and the data was available) the majority of the cases implemented by six project pilot companies can be evaluated as successful.

Costs and benefits for companies and society



Daiva Semėnienė, Environmental Economist

After our work in the project we can conclude that there is too little data on very important issues such as the imported, used, and

exported quantities of chemicals in the Baltic countries, effects of chemicals on the environment, and the monetised benefits of hazardous chemicals substitution/avoidance on the environment. These are huge impediments in understanding actual benefits of safer technologies, safer products, and in general, a safer and richer environment. The task was to try to answer the following questions:

- Are the substitutions and the resource usage changes beneficial to companies and to the whole society?
- What it would mean if we substituted certain hazardous chemicals in all similar companies in the Baltic States?
- Is it possible to express that in monetary terms or only qualitatively?

The project experts began by evaluating whether the selected substitute was financially beneficial for a company by comparing yearly financial costs with the used chemical and the new substance.

Annualised costs (i.e. annualised investments and operating and maintenance costs) of changes in technologies and, mostly, changes in operation and maintenance, range from negative 1 600 000 EUR (i.e. savings) up to 20 000 EUR per pilot company. Non-partner companies saved up to 36 000 EUR annually or require additional annualised costs up to 5 000 EUR per company due to changes in chemicals and resource efficiency measures applied during the project.

The second task captured the impacts for the human health and the environment caused by the changes. On the company level, substitution of hazardous substances or technologies reduced usage of natural resources, eliminated discharge of emissions, created better working environment and increased market potential. On the societal level, substitution led to improved air, water, soil, conditions for animal and plant habitats, better and more attractive living conditions for citizens, and a possibility to augment economic activities to some extent.

Small part of benefits to the environment and health can be monetised. We reviewed publicly available monetary assessments of health and environment improvement and adjusted them, where possible, to our pilot cases. Hence, could, with certain assumptions, make comparison of costs and benefits of the substitution and technology change to environmental amenities. Other priceless health and environmental amenities were described in qualitative terms.

Many improvements -

still a way to go

Chemicals legislation has a very long tradition and has evolved much over the last 60 years, in particular after REACH entered into force in 2007. At present, a new chemicals strategy is discussed at EU level, which seems to change the regulatory environment, again.

Before REACH, chemicals legislation mainly regulated the obligations of the placers on the market of chemicals. With REACH, also the users of chemicals were covered and included in the shared responsibility for the safe use of chemicals. However, the diversity of chemicals, products and companies increases and it appears that "standard solutions" do not work well (yet). Harm from chemicals can only be prevented if those that produce them ensure that they are either safe as such, or that everyone handling them as enough information to ensure no damage occurs. On the other hand, those handling chemicals must either choose chemicals that are safe or be able to (or learn how to) understand the information provided with hazardous chemicals. As long as these two sides of the coin are not optimised, risk management will remain cumbersome, a patchwork of necessary actions.

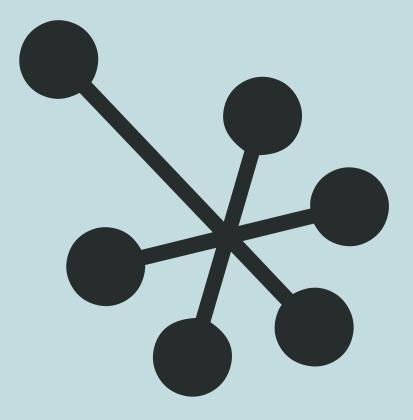


Antonia Reihlen, Chemicals Management Consultant

The project was challenging and exiting at a time. The large diversity of activities and the multitude of issues

the project team dealt with well represents the companies' every day challenges in chemicals management. The project was a success because of the ability to react with targeted guidance, tools, seminars and trainings but also, and in particular, the possibility to work 1:1 with companies that would normally not have asked consultants for help. Not only the lack of (financial) resources in companies could be overcome, but also manifold opportunities were given to ask specific questions, demand services that were adjusted to the individual needs. As the companies were the decision makers, the project team could not always influence the outcome of work, but most certainly left footprints in the mind-set and the management structures in the companies.

The project clearly showed that many companies are not yet able to fully understand and make efficient use of chemical information. However, it also highlighted that companies are willing, able and successful in improving their risk management – step by step - and substitute substances identified as hazardous, if motivated, supported and directly addressed. In the sense of "little strokes fell big oaks", it is important also to honour the small successes as they are the seed for future substitution and further improvement. Policy makers should consider increasing efforts and better tailoring the requirements to and tools for downstream user and considering that awareness and competences are still lagging behind the expected.



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