FitforREACH in Brief – Substitution and resource efficiency cases

1 Aim of the work

The project work aimed to reduce the use of hazardous substances either through substitution with less/non-hazardous alternatives, or through the increase of resource efficiency, such as optimising processes to reduce wastes and unnecessary emissions. More specifically, it sought to:

- Support the six partner companies in their substitution plans, to learn from them, and to generate good practice examples.
- Garner the interest of SMEs in substitution and chemicals risk management, as well as to support them in improving their priorities in areas such as capacity building, establishing inventories, and assessing compliance or substitution.

2 What was done and how?

Partner companies worked to phase out preselected substances during the project through the stages of searching for and assessing alternatives, testing and implementation. The project team assisted in all tasks, visited the companies several times, as well as provided consultation and feedback on the possible benefits and constraints of alternatives. Necessary investments and external assistance were supported by LIFE funding. At the end of the project, the team assessed the impacts of the substitution and resource efficiency cases (cf. FFR in Brief on project impacts).

For each case a report was prepared presenting the initial situation, the identified solutions, and the alternative selected by the partners. The reports are used for demonstrating and disseminating successful cases to a wider range of industrial enterprises.

In the partner companies, nine substitution cases were developed. Substitution of:

- Bisphenol A (BPA)-based epoxy resin coatings in food cans
- Dibutyltin dilaurate in construction joint sealants
- Diisononyl phthalate (DINP) in sealants for insulating glass units
- Nonylphenol in epoxy flooring lacquer
- Benzyl alcohol in epoxy flooring lacquer
- Sodium perborate in laundry detergents
- Sodium percarbonate in laundry detergents
- VOCs in thinners for priming of metal sheets for ship building and repair
- Methylene chloride in cleaning of equipment for producing polyurethane foams

In the partner companies, two cases on resource efficiency were implemented. The results were:

- Improved quality control of input polyol blend resulting in less reject materials (reduced use/wastage of methylene diphenyl diisocyanate (MDI)).
- Lower energy use by changing from a hot to a cold disinfection process, using basic chemicals as cleaners.

In addition to the partner cases, the project team cooperated with 76 companies of varying sizes, differing roles in the supply chain (mainly formulators, end-users and article producers), and from different sectors.

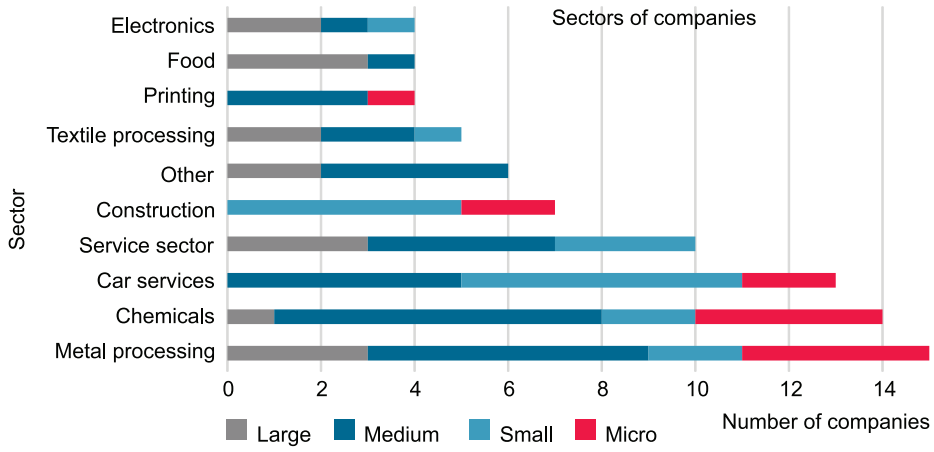

Figure 1: overview of sectors of participating companies.

The project team's work with companies involved different activities, including visiting the companies, discussing their priorities for chemical substitution, supporting the search for alternative substances or technologies, and helping in the assessment of alternatives. Chemicals risk management activities that were facilitated by the project team were related to improving inventories, consultations on occupational safety, and the quality of safety data sheets. Companies also received financial support to purchase chemical and/or technological alternatives. The support, likewise, assisted in testing the performance and technical properties of alternatives with their products to ensure they met the needs of the company.

3 A few findings...

A number of issues arose throughout the substitution process, confirming that substitution is neither a straightforward nor easy task:

1. In several cases, the time and resources needed were underestimated at the planning stage.
2. Search for alternatives proved to be very difficult.
3. In some cases, all the identified alternatives had some drawbacks regarding hazard/ risk, technological feasibility or cost.
4. Requirements for chemicals risk reduction, technological demands, economic issues, and consumer requirements often contradicted each other.
5. Quite high costs were involved – a project initially thought to be uncomplicated, still required 18 months for its implementation with investment and testing costs of nearly 30 000 Euro.

Regarding non-partner companies, the safe use of hazardous substances was not always observed. Several hazardous substances were successfully substituted from several products and processes, demonstrating substitution is possible for small- and medium-sized companies. Some processing auxiliaries were were substituted at comparably low cost. Shortcomings of the substitution process included:

1. Company inventories were either of low quality or absent. Often, they were not used to prioritise risk management or substitution needs.
2. Substitution was triggered by legal requirements, worker and environmental protections, customer demands, or company image.
3. Substitution barriers included need for larger investments (technology lock), missing or costly alternatives, uncertainties on product performance, deficits in a company's internal organisation, as well as a lack of commitment of responsible persons or top management of the company. Additionally, customer demands, certification needs and industrial standards limited the types of possible alternatives.
4. Benefits of chemicals risk management were not obvious, and good examples were missing.

4 Achievements

All cases intended for implementation in the partner companies before the project started were conducted. However, some cases had no implementable solution and the work on those particular substances was stopped. Instead, other substances were identified and included into the work of those partner companies. Overall, all substitution cases were finalised within the project duration, and the necessary changes implemented in the composition and design of the products placed on the market. For details on the evaluation of these cases see the FFR in Brief on Project Impacts.

In total, the partner companies use about 290 tonnes less per year of carcinogenic, mutagenic and reprotoxic substances (Cat. 1A, 1B and 2) due to substitution in the project. Of these, almost 500 kg/year are also endocrine disrupters.

Eighty-seven “cases” were implemented among the non-partner companies, of which 19 were in Latvia, 30 in Lithuania, and 32 in Estonia. The following figure shows which topics were discussed during the company consultations. It is to be noted that in many cases more than one topic was discussed and, due to the project aim of initiating substitution, this topic was discussed with all companies unless a company clearly indicated that more basic issues or specific problems should be in focus.

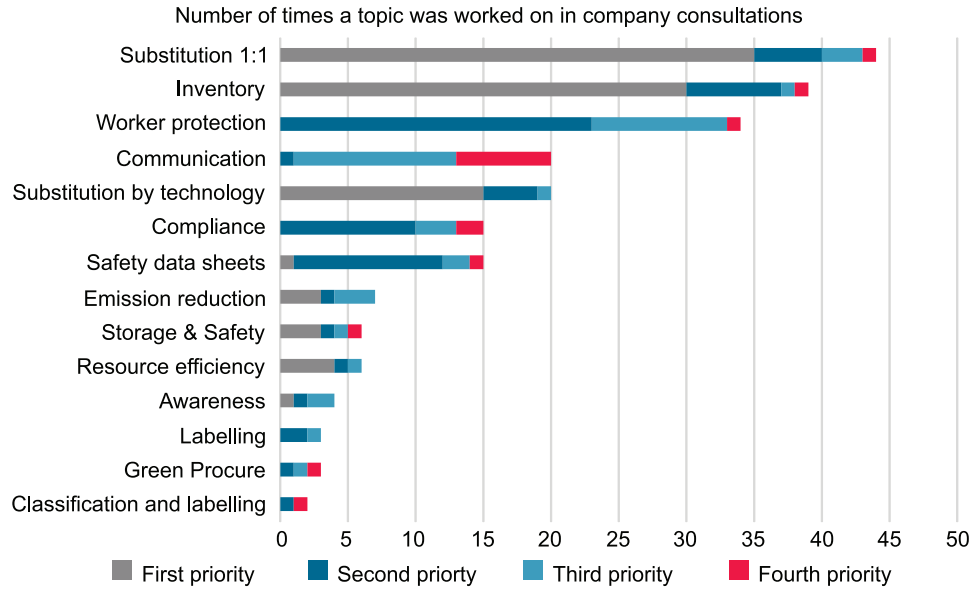

Figure 2. Overview of topics discussed (and partly implemented) with the non-partner” companies.

Taking into account all the implemented cases, 49 involved substitution of different types of hazardous substances, often comprising of SVHCs and CMRs. The following figures illustrate which types of companies substituted either by alternative chemicals (substitution 1:1) or by alternative technologies. It should be noted that the latter partly included a change of the used chemicals.

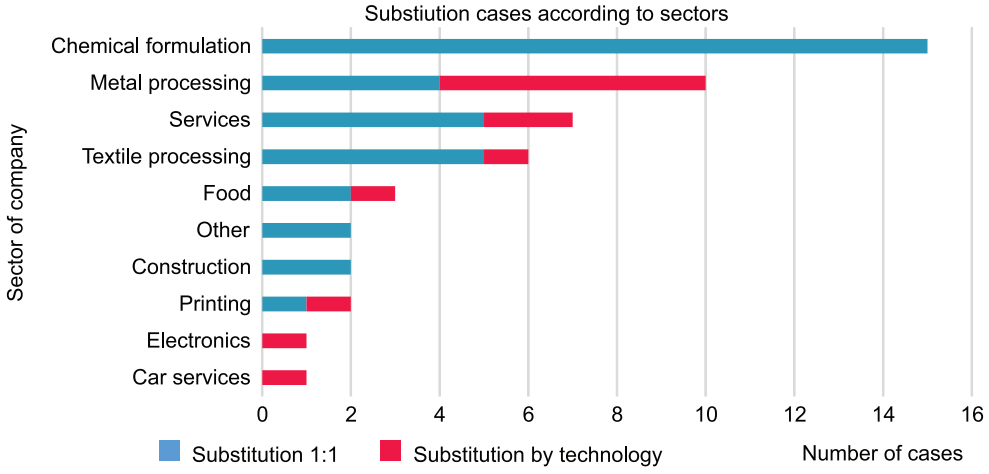

Figure 3. Types of substitution according to industry sectors.

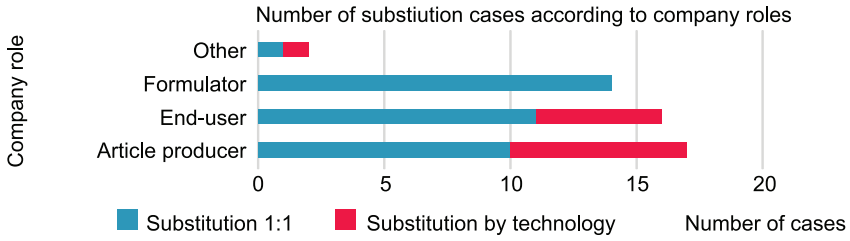

Figure 4. Types of substitution according to company role.

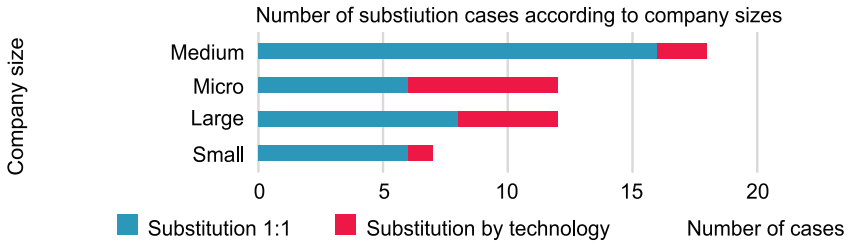

Figure 5. Types of substitution according to company size.

4 Conclusions and recommendations

Priority setting, assessing alternatives and access to funding proved to be crucial steps in the substitution process for companies. Although several tools are available to support decision-making, with (some) funding in the Baltic States, companies do not yet use them. Therefore, simpler tools are needed and/or support for their use, as well as unbureaucratic options to obtain funding for substitution.

- EU and national funding programmes should specifically target substitution of substances of concern. This may entail measures ranging from obliging large research consortia to include SMEs in their activities in the funding rules, to establishing small-scale grants with easy application and documentation procedures for targeted substitution cases.
- EU legislation, in particular the candidate list for authorisation and restrictions, are important substitution triggers. Member States and ECHA should, therefore, increase their efforts to identify SVHCs and restrict substances in uses causing unacceptable risks.
- National competent authorities and/or helpdesks, as well as industry associations should increase competences to advise companies how to apply for funding to support substitution.
- All stakeholders should invest in developing “substitution centers” to support companies in substitution. To enable access for companies with little resources, these substitution centers should be independently funded, e.g. by substance manufacturers (fees).
- Industry associations, consultants and training institutions should assess existing priority setting and alternatives assessment tools, in particular with regard to their applicability to mixtures. They should revise/newly develop approaches that are actually used and provide targeted, accessible and affordable training on substitution, including inhouse, to enable specific discussions and avoid confidentiality concerns.
- Industry associations, ECHA, and Member States should consider increasing their efforts to develop alternatives, in particular to SVHCs, and make their availability known to all stakeholders considering substitution.
- Downstream users should dedicate sufficient human resources to build capacity in substitution, and establish internal working groups and cooperation routines to facilitate information collection and decision making on substitution.

The Project LIFE Fit for REACH, No. LIFE14ENV/LV000174 is co-financed with the contribution of the LIFE Programme of the European Union.
The content of this report is the sole responsibility of the project LIFE Fit for REACH and can in no way be taken to reflect the views of the EU.

The Project “Baltic pilot cases on reduction of emissions by substitution of hazardous chemicals and resource efficiency” [LIFE Fit for REACH, Nr.LIFE14ENV/LV000174] is co-financed with the contribution of the LIFE financial instrument of the European Community.