Lowell Center for Sustainable Production
UNIVERSITY OF MASSACHUSETTS LOWELL

Alternatives Assessment 116 Webinar:

Transitioning to safer chemicals to protect workers

DECEMBER 9, 2013

FACILITATED BY: JOEL TICKNER, SCD

JOEL_TICKNER@UML.EDU
LOWELL CENTER FOR SUSTAINABLE PRODUCTION, UMASS LOWELL

** If you would like to ask a question or comment during this webinar please type your question in the Q&A box located in the control panel.*

Goals

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- Continuing education and dialog

- To advance the practice of alternatives assessment for informed substitution across federal, state, and local agencies through networking, sharing of experiences, development of common approaches, tools, datasets and frameworks, and creation of a community of practice.

Purpose of this call

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- Workers are often at the front lines of impacts of chemical exposures and regrettable substitutions
- Yet, substitution has always been at the top of the hierarchy of controls for protecting workers from workplace hazards
- A number of policies specifically call on substitution of dangerous substances in the workplace and tools have been developed to support employers in identifying and adopting safer chemistry
- In this webinar, the authors of the OSHA toolkit on Transitioning to Safer Chemicals and the European Union guide on Minimizing chemical risk to workers' health and safety through substitution will provide an overview of their support tools and how they are or can be used in practice.

Speakers

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- Nuria Cavelle-Oller, European Commission, DG Employment, Social Affairs and Inclusion
- Ylva Gilbert, GAIA, Finland
- Rebecca Reindel, US Occupational Safety and Health Administration
- Jessica Schifano, US Occupational Safety and Health Administration

Discussion Questions

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- What are the key steps of a substitution assessment process to protect workers from chemical hazards?
- How can these tools help employers avoid regrettable substitutions?
- How can employers and workers obtain necessary resources to apply these tools.
- What successes and challenges are faced in attempting to use/apply these tools and in substitution in general?

Webinar Discussion Instructions

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- Due to the number of participants on the Webinar, all lines will be muted.
- If you wish to ask a question, please type your question in the Q&A box located in the drop down control panel at the top of the screen.
- All questions will be answered at the end of the presentations.

EU Occupational Safety & Health legislation in chemicals – policy development

Luxembourg, 9 December 2013

Transitioning to Safer Chemicals: A Toolkit for Employers and Workers

Nuria CAVALLE OLLER
Policy Officer
European Commission
Directorate-General EMPLOYMENT
Unit B3: Health, Safety and Hygiene at work

Outline

1. *General EU OSH framework*
2. *The principle of substitution in the EU legislation*
3. *EU Technical Guides and studies*
4. *MS initiatives in Substitution*
5. *Conclusions*

EU Occupational health and safety policy and laws

- The European Commission develops initiatives in the EU-OSH policy framework, proposes legislation and publishes non-binding guidance
- The European Parliament and the Council adopt the EU Directives
- The Member States **implement** and **enforce** the laws and set their own policies having regard of the EU framework
- EU Occupational Safety and Health Agency (EU-OSHA) for dissemination and communication
- The Commission is supported by Scientific Committee (SCOEL)

OSH EU Directives on exposure to chemicals at the workplace, directly or indirectly

Directive 89/391/EEC: framework directive
Directive 89/654/EEC: workplaces
Directive 92/57/EEC: mobile construction sites
Directive 92/58/EEC: safety and/or health signs at work
Directive 92/85/EEC: pregnant workers, recently given birth or breastfeeding
Directive 94/33/EC: young people at work
Directive 98/24/EC: chemical agents at work ***(CAD)***
Directive 99/92/EC: explosive atmospheres
Directive 2004/37/EC: carcinogens, mutagens at work ***(CMD)***
Directive 2009/148/EC: asbestos at work

The principle of substitution in the EU legislation for workers protection (I)

98/24/EC (CAD), article 6:

In eliminating or reducing the risk, substitution shall by preference be undertaken, whereby the employer shall avoid the use of a hazardous chemical agent by replacing it with a chemical agent or process which, under its condition of use, is not hazardous or less hazardous to workers' safety and health, as the case may be.

The principle of substitution in the EU legislation for workers protection (II)

2004/37/EC (CMD), article 4:

The employer shall reduce the use of a carcinogen or mutagen at the workplace, in particular by replacing it, in so far as is technically possible, by a substance, preparation or process which, under its conditions of use, is not dangerous or is less dangerous to workers' health or safety.

Hazardous chemicals substitution in other fields of the EU legislation on chemicals

REACH Regulation *(EC n. 1907/2006) on the* ***RE****gistration,* ***E****valuation,* ***A****uthorisation and Restriction of* ***Ch****emicals*

Authorisation process:

- *Demonstrate adequate control or positive socio-economic balance*
- *Alternatives assessment*
- *R&D activities*

Technical Guides and Study Reports

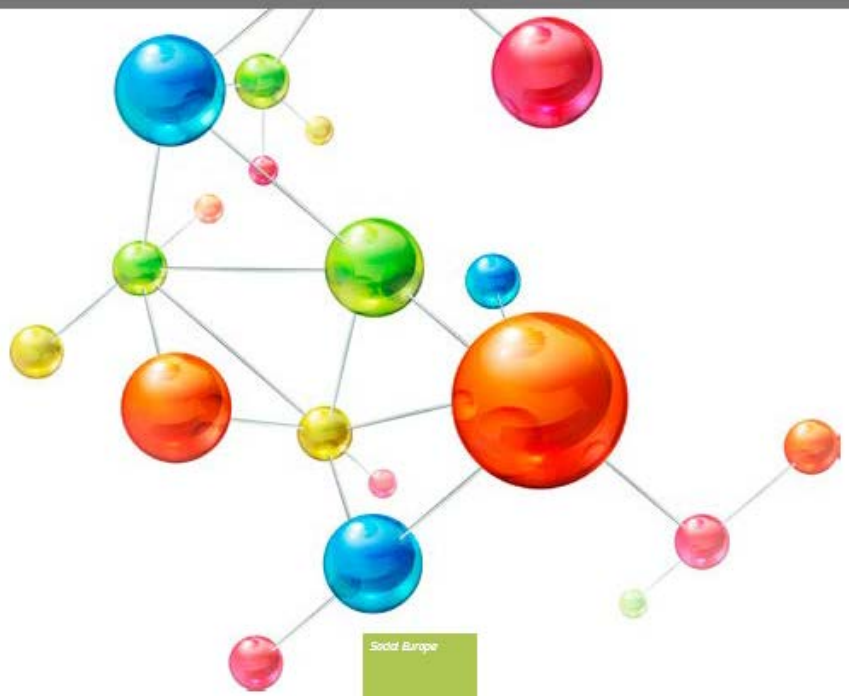
- Non-Binding nature
- Performed by external contractors under supervision of the European Commission
- User-oriented: employers/workers/professionals
- Freely available in EU Bookshop: https://bookshop.europa.eu/en/home/

European Commission

Minimising

chemical risk

to workers' health and safety through substitution



Social Europe

Other studies: CADimple

WHAT WORKS !

- "Easy" substitutions
- Substitution by the supplier
- Substitution where reference cases works

WHAT DOESN'T WORK

- Few substitutions by employers without chemical knowledge
- Fear for economic and technological consequences

Some initiatives at MS level:

Case studies / Practical experiences

SUBSPORT (EU level): http://www.subsport.eu
FRANCE: Substitution CMR http://www.substitution-cmr.fr/
GERMANY: TRGS 600: http://www.baua.de/en
DENMARK: http://www.catsub.eu
SPAIN: Infocarquim http://infocarquim.insht.es

Toolkits / Management

7 Steps to Substitution (UK): http://www.hse.gov.uk
The Column Model (Germany)
La substitution en 9 etapes (France)

And many others!

TRGS 600

Contents

	Paint strippers containing dimethyl sulfoxide or N-methyl-2-pyrrolidone should not be used since they are readily absorbed through the skin and also aid skin resorption of substances such as aromatic hydrocarbons (PAHs).
	substitution of process or technology - paint removal with abrasive blasting equipment (e.g. dry, wet and slurry blasting; high-pressure water jet blasting) (often suitable and technically feasible for outdoor use) - sanding with carbide- or diamond-tipped milling cutters (for mineral and wood substrates) (check individually, whether explosion-proof separation systems are required) - hot air or other thermal treatment (application in certain individual cases, these measures are not recommended in case of potential formation of thermal decomposition products, particularly chlorine- or lead-containing coating materials, and the risk of fire)

SUBSPORT
Substitution Support Portal

MOVING TOWARDS SAFER ALTERNATIVES

Support for Substitution

Substitution of hazardous chemicals is a fundamental measure to reduce risks to environment, workers, consumers and public health.

Legislation encourages you to substitute, this site will show you how.

Read more

Latest News

SUBSPORT Textile

SUBSPORT Project News | 18.11.2013

A new project to present textile -specific substitution information on the SUBSPORT portal has been launched by Kooperationsstelle Hamburg. The project is financially supported for one year by the Deutsche Bundesstiftung Umwelt (DBU, **www.dbu.de**). DBU is one of Europe's largest foundations and promotes innovative and exemplary environmental projects. A new section of the SUBSPORT portal containing the project description and a flyer has been published **here**.

Read more

Substitution Steps

Substitution may be fast and easy or a more complex process. Generally it includes the following steps:

1. Define the problem
2. Set substitution criteria
3. Search for alternatives
4. Assess and compare alternatives
5. Experiment on pilot
6. Implement and improve

Read more

Search SUBSPORT

- Website
- Restricted and priority substances database » link
- Case story database » link

Search » Overview

External substitution websites and databases

Search

Your contribution

Provide substitution examples
Provide feedback

Training

Alternatives identification and assessment

Welcome to SUBSPORT the Substitution Support Portal!

Here you can find information to support your efforts in substituting hazardous substances. Enjoy exploring the portal and please do not hesitate to **contact** the project team for any comments or questions.

SUBSPORT is an ongoing project. Therefore we recommend to revisit the portal from time to time if

Financial Support by

DBU

substitution-cmr.fr

Partagez votre expérience de substitution
Espace personnel

Accueil

Page créée le 05.11.2008 | Page mise à jour le 25.10.2013

OBJECTIFS DU SITE

Destiné à tous les professionnels et acteurs de la prévention qui souhaitent engager une démarche de substitution des substances chimiques cancérogènes, mutagènes ou toxiques pour la reproduction (CMR) dans leur établissement, ce site a pour objectif de faire connaître les actions réalisées, les travaux en cours et l'avancée de la recherche dans le domaine de la substitution. En offrant plusieurs niveaux d'information, il doit permettre d'aider ces différents acteurs à rechercher des solutions alternatives à l'utilisation de substances CMR de catégories 1 et 2.

Actualités

RSS

Actualités générales

Le site substitution-cmr.fr se dote d'une lettre d'information

Professionnels, acteurs de la prévention ou tout simplement intéressé par nos thématiques de travail… grâce à la lettre d'information du site substitution-cmr.fr, retrouvez tous les 3 mois dans votre boîte mail l'essentiel de...

› Lire la suite

Voir toute l'actualité générale

Publications

Bilans et rapports sur les conditions de travail en 2012

Le Comité permanent du Conseil d'orientation sur les conditions de travail (COCT) a examiné le 20 septembre 2013 le bilan des conditions de travail pour l'année 2012.

› Lire la suite

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
MINISTÈRE DU TRAVAIL, DE L'EMPLOI, DE LA FORMATION PROFESSIONNELLE ET DU DIALOGUE SOCIAL

Travailler avec des produits chimiques. Pensez prévention des risques !

BOÎTE À OUTILS

Rechercher sur tout le site

OK

› Recherche avancée

Les exemples de substitution en 3 clics :

Substances

Numéros CAS

Liste des secteurs d'activité

› Ou entrez votre code NAF (4 chiffres et 1 lettre, sous la forme : 00.00A)

OK

Vous pouvez télécharger la dernière lettre d'information

Octobre 2013

La brochure ci-contre, téléchargeable, a été réalisée en partenariat avec la CNAMTS. Elle décrit les enjeux et le fonctionnement du site substitution-cmr.

Substances mises à jour RSS

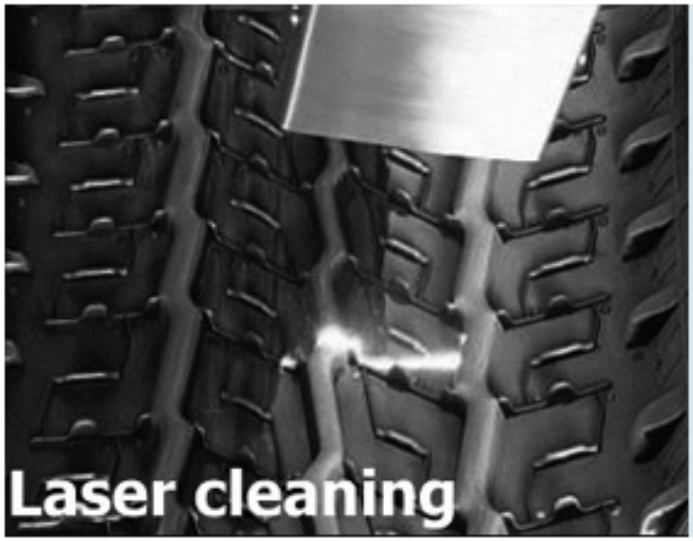
2-bromopropane [75-26-3]
2-éthoxyéthanol [110-80-5]
4,4'-méthylène bis(2-chloroaniline) [101-14-4]

cleantool®

inrs istas Kooperationsstelle Hamburg

Deutsch **English** Français Español

- Home
- The Project
- User Reactions
- Especially innovative database processes
- News
- Parts cleaning
- Cleaning search
- Glossary
- Info plus
- Contacts & Services
- Site Map
- Search Site

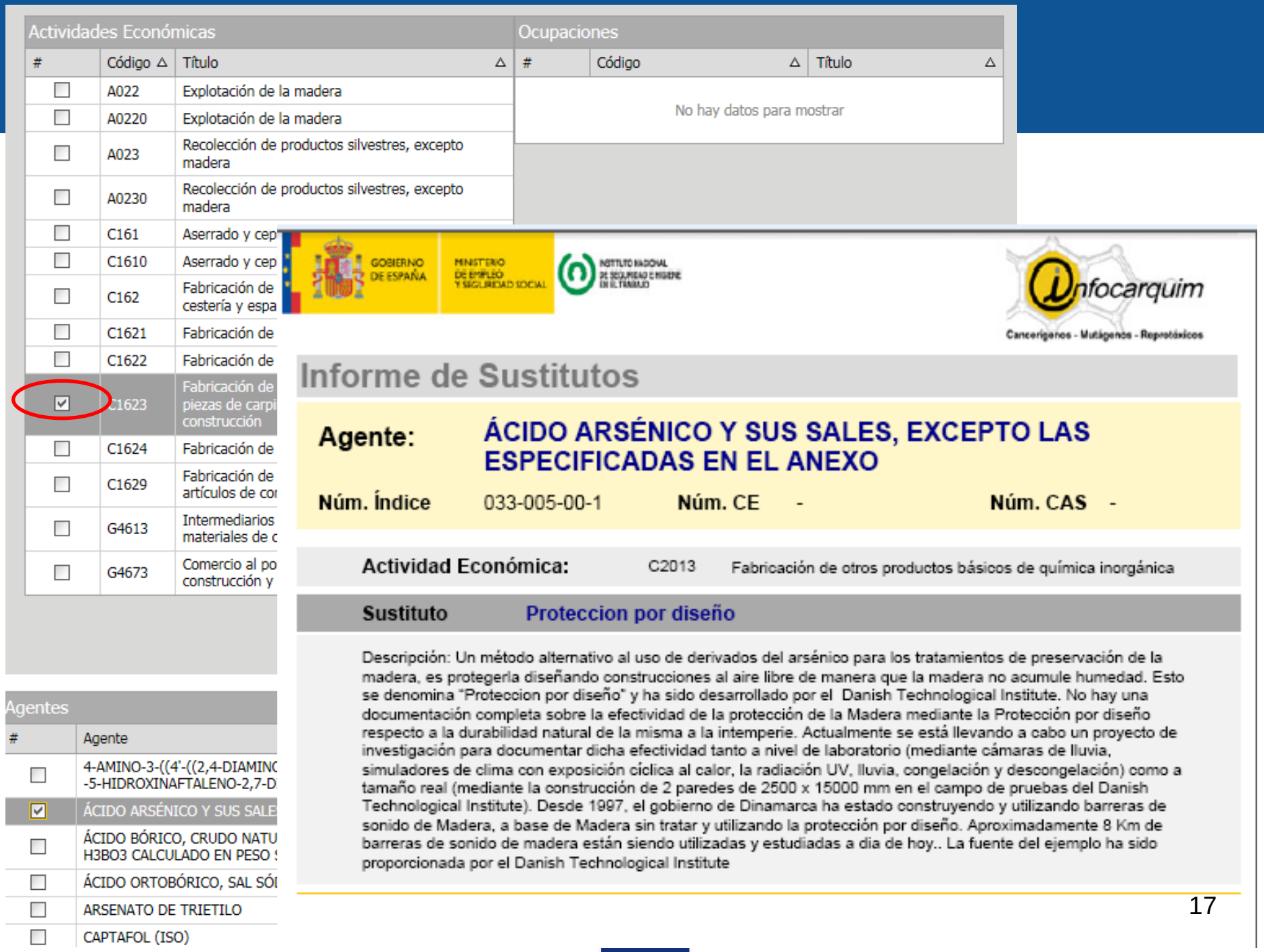


Optimization of Metal Surface Cleaning

Home

CLEANTOOL is a Europe wide database for parts cleaning, metal surface cleaning, component cleaning and degreasing, based on real processes in numerous European companies.

These processes plus the involved agents and equipments have been developed in small and large European enterprises and are being applied regularly. They represent reliable daily practice. The project advisory boards, consisting of long standing cleaning specialist, consider them as good/best solution for the respective cleaning requirements.


Actividades Económicas
Código Título
A022 Explotación de la madera
A0220 Explotación de la madera
A023 Recolección de productos silvestres, excepto madera
A0230 Recolección de productos silvestres, excepto madera
C161 Aserrado y cep
C1610 Aserrado y cep
C162 Fabricación de cestería y espa
C1621 Fabricación de
C1622 Fabricación de
C1623 Fabricación de piezas de carpi construcción
C1624 Fabricación de
C1629 Fabricación de artículos de cor
G4613 Intermediarios materiales de c
G4673 Comercio al po construcción y
Ocupaciones
Código Título
No hay datos para mostrar
Agentes
Agente
4-AMINO-3-((4'-((2,4-DIAMINO -5-HIDROXINAFTALENO-2,7-D
ÁCIDO ARSÉNICO Y SUS SALE
ÁCIDO BÓRICO, CRUDO NATU H3BO3 CALCULADO EN PESO S
ÁCIDO ORTOBÓRICO, SAL SÓ
ARSENATO DE TRIETILO
CAPTAFOL (ISO)
GOBIERNO DE ESPAÑA
MINISTERIO DE EMPLEO Y SEGURIDAD SOCIAL
INSTITUTO NACIONAL DE SEGURIDAD E HIGIENE EN EL TRABAJO
Infocarquim
Cancerígenos - Mutágenos - Reprotóxicos
Informe de Sustitutos
Agente: ÁCIDO ARSÉNICO Y SUS SALES, EXCEPTO LAS ESPECIFICADAS EN EL ANEXO
Núm. Índice 033-005-00-1 Núm. CE - Núm. CAS -
Actividad Económica: C2013 Fabricación de otros productos básicos de química inorgánica
Sustituto Proteccion por diseño
Descripción: Un método alternativo al uso de derivados del arsénico para los tratamientos de preservación de la madera, es protegerla diseñando construcciones al aire libre de manera que la madera no acumule humedad. Esto se denomina "Proteccion por diseño" y ha sido desarrollado por el Danish Technological Institute. No hay una documentación completa sobre la efectividad de la protección de la Madera mediante la Protección por diseño respecto a la durabilidad natural de la misma a la intemperie. Actualmente se está llevando a cabo un proyecto de investigación para documentar dicha efectividad tanto a nivel de laboratorio (mediante cámaras de lluvia, simuladores de clima con exposición cíclica al calor, la radiación UV, lluvia, congelación y descongelación) como a tamaño real (mediante la construcción de 2 paredes de 2500 x 15000 mm en el campo de pruebas del Danish Technological Institute). Desde 1997, el gobierno de Dinamarca ha estado construyendo y utilizando barreras de sonido de Madera, a base de Madera sin tratar y utilizando la protección por diseño. Aproximadamente 8 Km de barreras de sonido de madera están siendo utilizadas y estudiadas a dia de hoy.. La fuente del ejemplo ha sido proporcionada por el Danish Technological Institute

Conclusions / Needs

- The substitution principle is properly supported by legislation, but more effective implementation is needed in practice
  - Sector specific guidance and decision tools
  - Dissemination of reference cases and case studies
  - Incentives to start complex substitution processes and support in R&D
- Ex-post evaluation of 24 EU Directives by the end of 2015

*Substitution: From principles to practice**

A project for the EU

DG Employment, Social Affairs & Inclusion

Gaia Consulting

Ylva Gilbert

* "Analysis and evaluation of the practical implementation of the principle of substitution of hazardous chemicals in the workplace by less hazardous chemicals or associated processes for the purpose of protecting the H&S of workers"

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Contents

- Project overview, target groups and methods
- Results in brief (illustration of process)
  - The common framework
  - 4 step process
  - 7 Step process
- What could be done next

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Project overview

A short hop, skip and jump through the What, why, how and to whom

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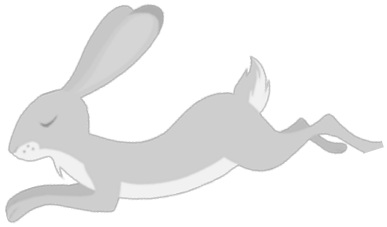
Overview: What, why and how

Duration January 2010 – June 2011



- **Study aims and objectives**
  - What is the current state of substitution?
  - Can a common approach/framework be developed?
  - If so, what should it address and how should it be presented?
  - Prepare **a draft guidance document** **if** a common substitution approach is seen as viable
- **Deliverable aim and objectives**
  - Reduce OHS risk at the workplace
  - Provide SME's with practical help
  - Promote wider use of substitution
  - Show that substitution is a viable risk reduction measure available to all companies
- **Working methods**
  - Secondary and primary data, expert analysis and workshop

What & How

The wish lists for the process and results

Blue = Outside scope

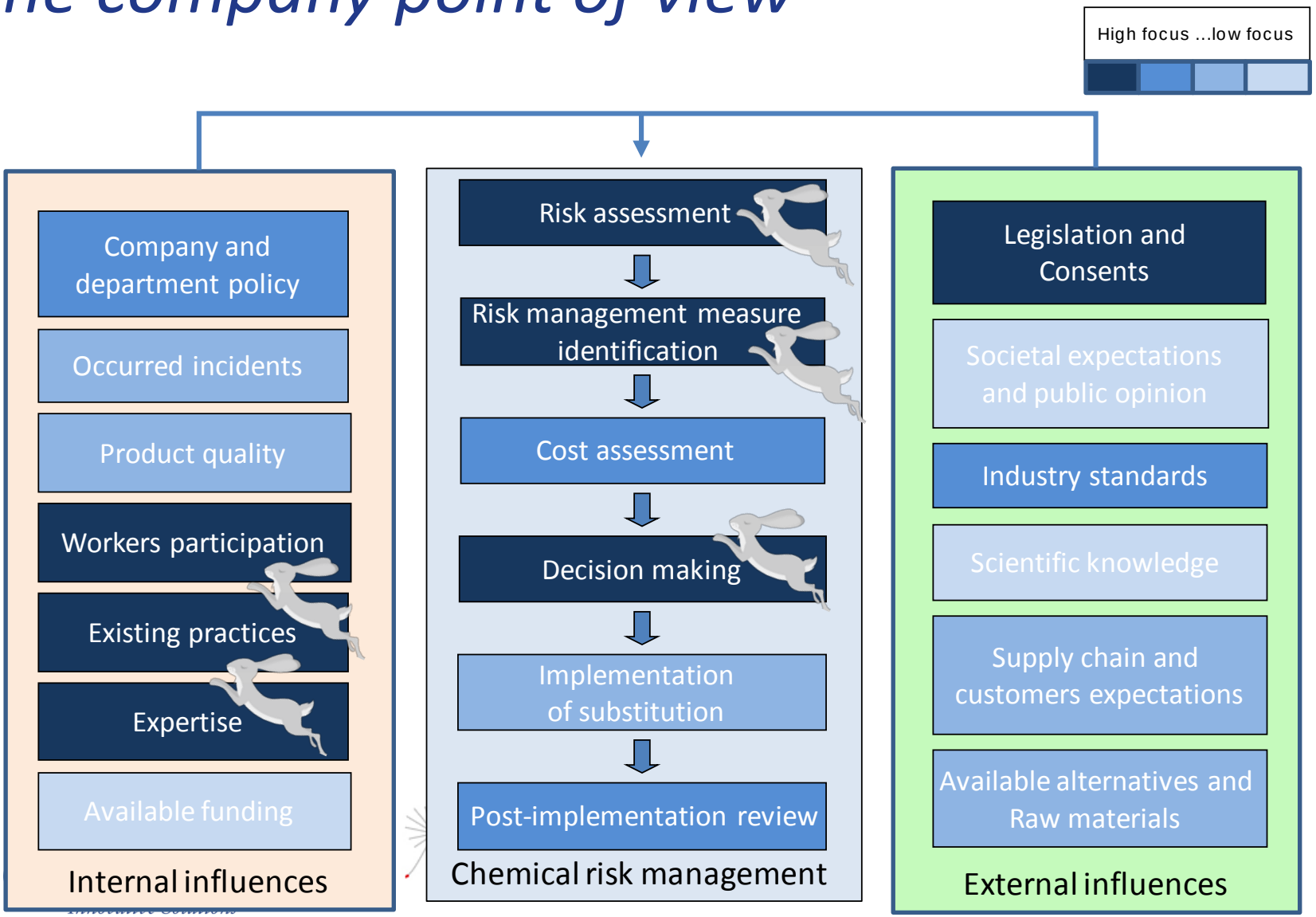
THE PROCESS

- **Simple and short**
  - easy to understand, as short as possible
  - in line with REACH and other legislation
  - concrete and linked to other sources and tools
- **Management orientated**
  - Including and addressing cost and benefit aspects
- **Consider**
  - The type of substitution
  - The relative effort needed
  - The type of chemical use
- **Process and task orientated**
  - Process/task dependent (e.g. why uses chemicals and for what)
  - Not linked to company size *per se*
- **Vital issues affecting the practical process**
  - The position of the company in the value chain
  - How and why the chemical is used

THE GUIDANCE

- **Type of guidance**
  - Step-by-step guidance
  - Industry specific/sector specific guidance
  - "Substitution for beginners" type of easy-to-use basics
- **Guidance for**
  - Support management and decision making
  - Mapping out the decision points such as flowcharts
  - Identifying chemicals for substitution
  - Prioritising chemicals for substitution
  - How to compare substitution benefits and costs
- **Type of information**
  - Examples of successful substitution; links to library/database of successful substitution
  - Process examples of decisions and decision points
  - Examples of data needed to assess substitution
  - Lists of chemicals to substitute

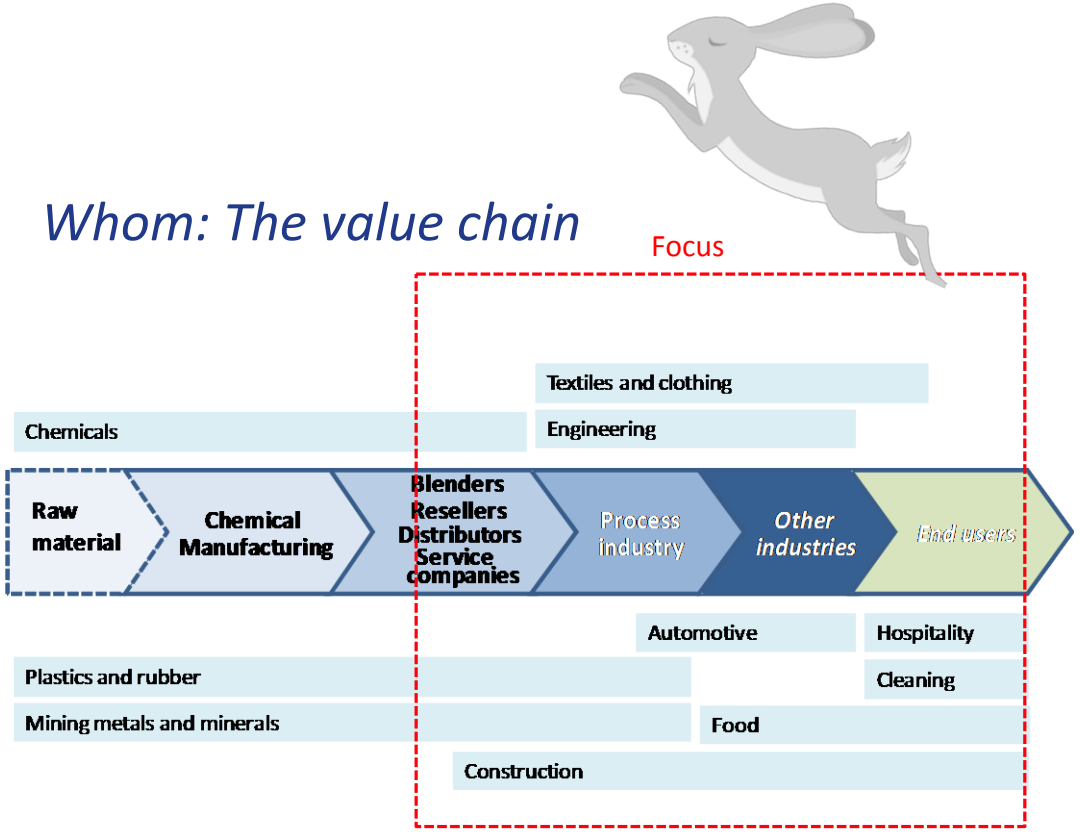
What: Study framework viewed from the company point of view



Target groups

- The objective was a common ”core process” applicable to:
  - All EU countries
  - All industries *
  - All sizes of companies
- Target groups
  - Small /micro sized companies that need ”something very simple”
  - Companies with some HSE expertise that are not so familiar with chemical risk management**

Whom: The value chain



** The work did not attempt to deliver a solution for companies where chemical risk management is a core process*

***The guidance should also be helpful for companies where chemical risk management is at reasonable level, but some pointers to best practices are needed*

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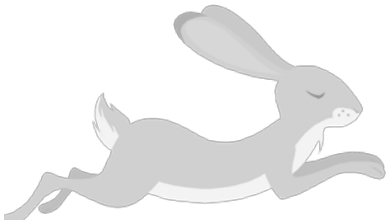


TO WHAT CAN WE CHANGE

How and Why: Availability of alternatives

Focus

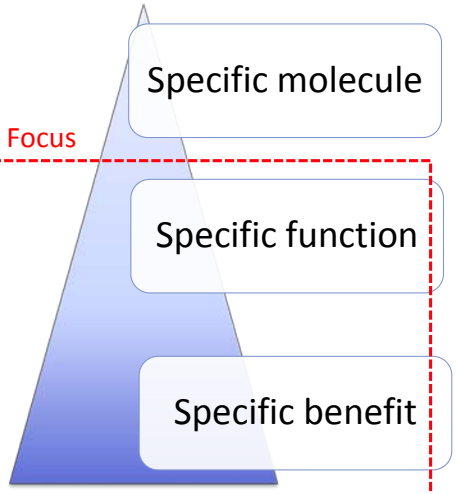
1. **Tried and tested alternatives available**
   - No lengthy testing or piloting required
   - Requires knowledge about alternatives
2. **Substitution of a chemical with an alternative that will also require process changes**
   - Requires consideration of processes; more complex
3. **Non-proven alternatives**
   - Requires R&D and piloting
   - Most complex and time consuming

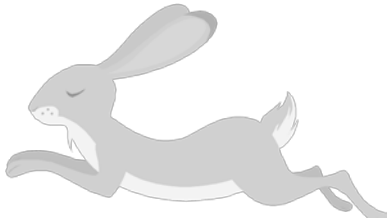
How & Why: Chemical use affects how substitution can be approached

1. **If the exact chemical (molecule) is required (for whatever reason);**
   - ➔ the process can be made safer or, if viable, chemical reaction changed to safer

Focus

2. **If a very specific chemical functionality is necessary**
   - ➔ the chemical can potentially be changed but this most probably requires a lengthy R&D process
3. **If the chemical is used more generically i.e. for a specific task**
   - ➔ There could be several alternatives available that still perform the same task (e.g. cleaning floor)





WHAT **CAN** WE CHANGE

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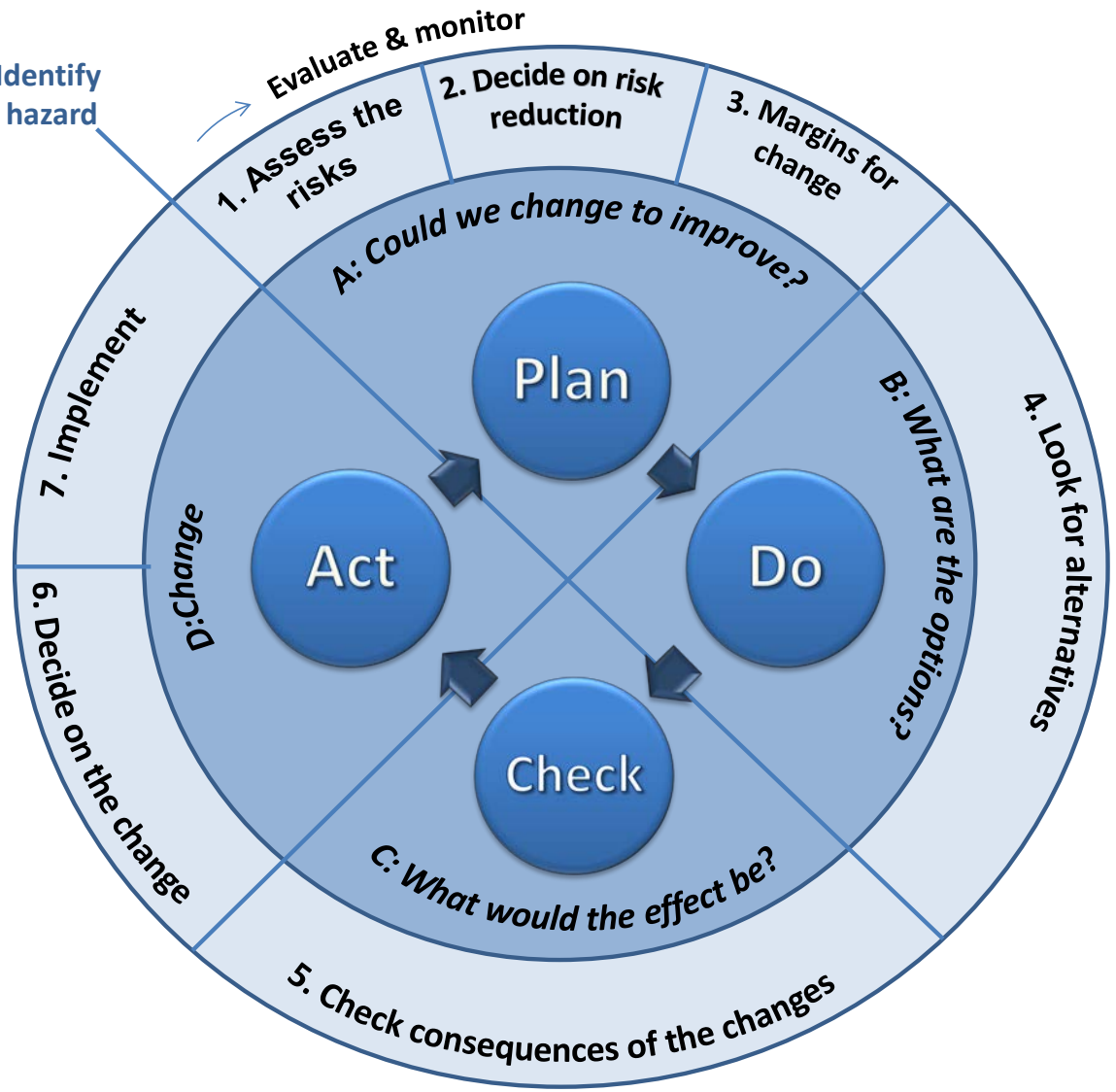
Results

The framework



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Project results: A unified framework

- Outline of the required steps
  - Industry/Sector/Trade associations and country authorities can then "fill in" specific requirements or considerations to take into account
  - The role of the chemical industry is largely one of "providing support" to the users
- Presented in two parts (DRAFTS)
  1. A simple, short check list type approach in four steps for very small companies or companies with little or no "chemical knowledge"
  2. A practical and management orientated step-by-step process in seven steps, suitable for slightly larger or more knowledgeable companies

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Guidance document

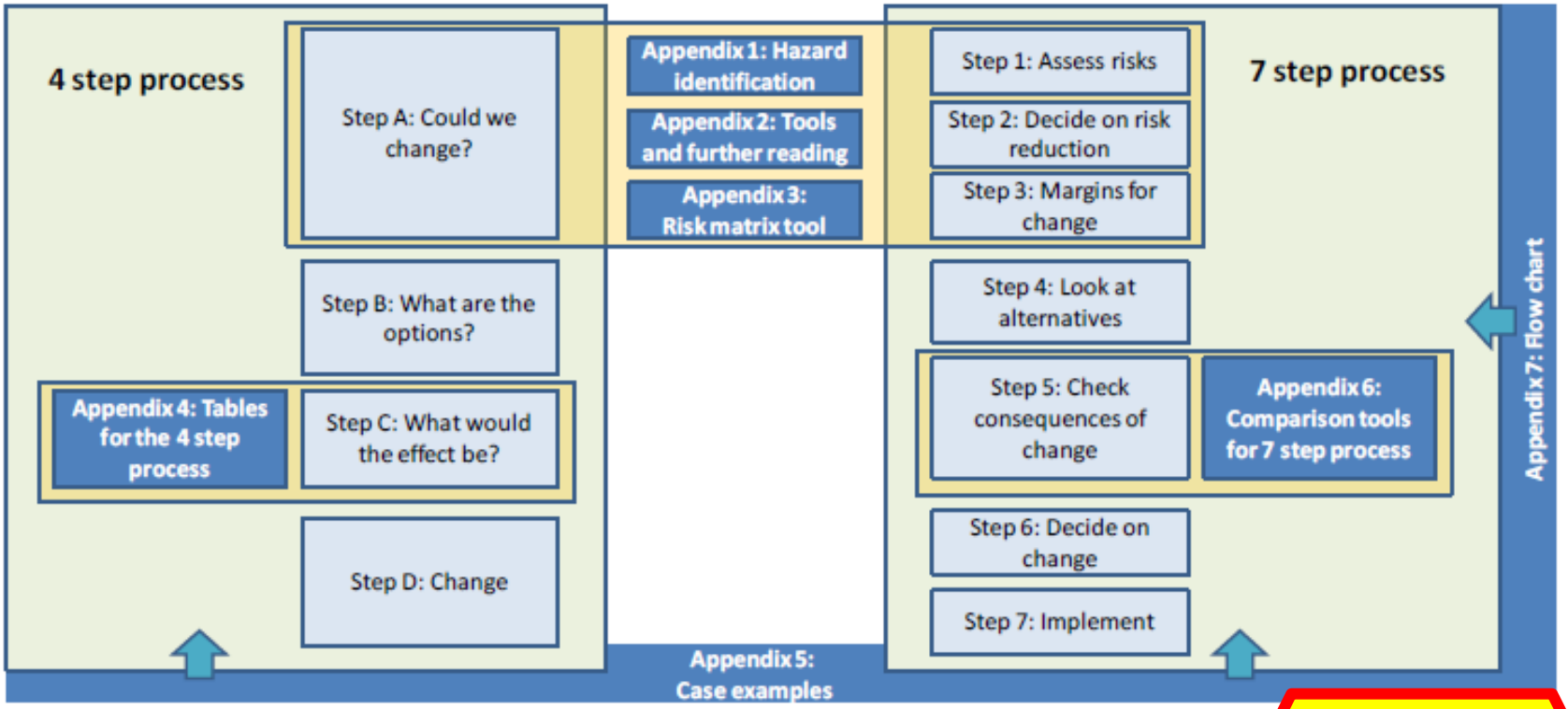

Figure I-2: Structure of Guidance and Appendices

Would benefit from further simplification

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Could we benefit from substitution

- Check list for companies who consider using substitution

Question	Yes / No	Note
1. Are we using chemicals?		Using less hazardous chemicals or stopping the use altogether (eliminatir can **increase safety and reduce cost**. You can also apply the same type thinking to any other hazardous materials or processes. **Make sure that y do not have many chemicals for one job – reducing the number chemicals will also help you reduce risk.**
2. Could we/should we reduce the risk to workers health and safety from our chemical use?		By law, you must know and control risks from chemicals you use[1] . **Changing to less hazardous chemicals or reducing the number chemicals could simplify the paperwork done for permits/ authorities.**
3. Do we have a legal obligation to substitute?		If you use chemicals classified as Cat 1/2 carcinogenic or mutage chemicals you must replace them so far as is technically possible[2]. **If it is not possible, you have to discuss the implications with t authorities.**
4. Are hazardous fumes or dust created at our work place?		Even if the materials or chemicals themselves may not be hazardous, y may be using them in such a way that there is a risk to workers. **Changi the source of fumes or dust, the processes or working practices c increase safety and reduce cost.**
5. Do we use chemicals often and /or in large amounts?		If you use chemicals in large amounts and/or repeatedly, this increases t chance of harm to you, your workers and/or the environment. **Finding alternatives or different ways of working can help you reduce t amount of chemical you use or how often you have to use the chemica**
6. Do we use control measures to reduce chemical risks?		You may be using technology, automation, procedures or perso protective equipment to control risks. Control measures are specified the supplier for each chemical – look at the safety data sheet to check y are using these. Changing to less hazardous chemicals or changing the w you work can reduce the need for control measures, **protect worke health and safety** and enhance wellbeing. **You might also be able to reduce the cost of controlling chemical risk**.
7. Do we want our image and competitive edge to be better?		Increasingly, companies are looking for safe and sustainable solutio Changing to safer chemicals or working practices could help you meet yc customer's criteria and give you **competitive advantage. Innovative saf solutions may give you a powerful sales argument.**

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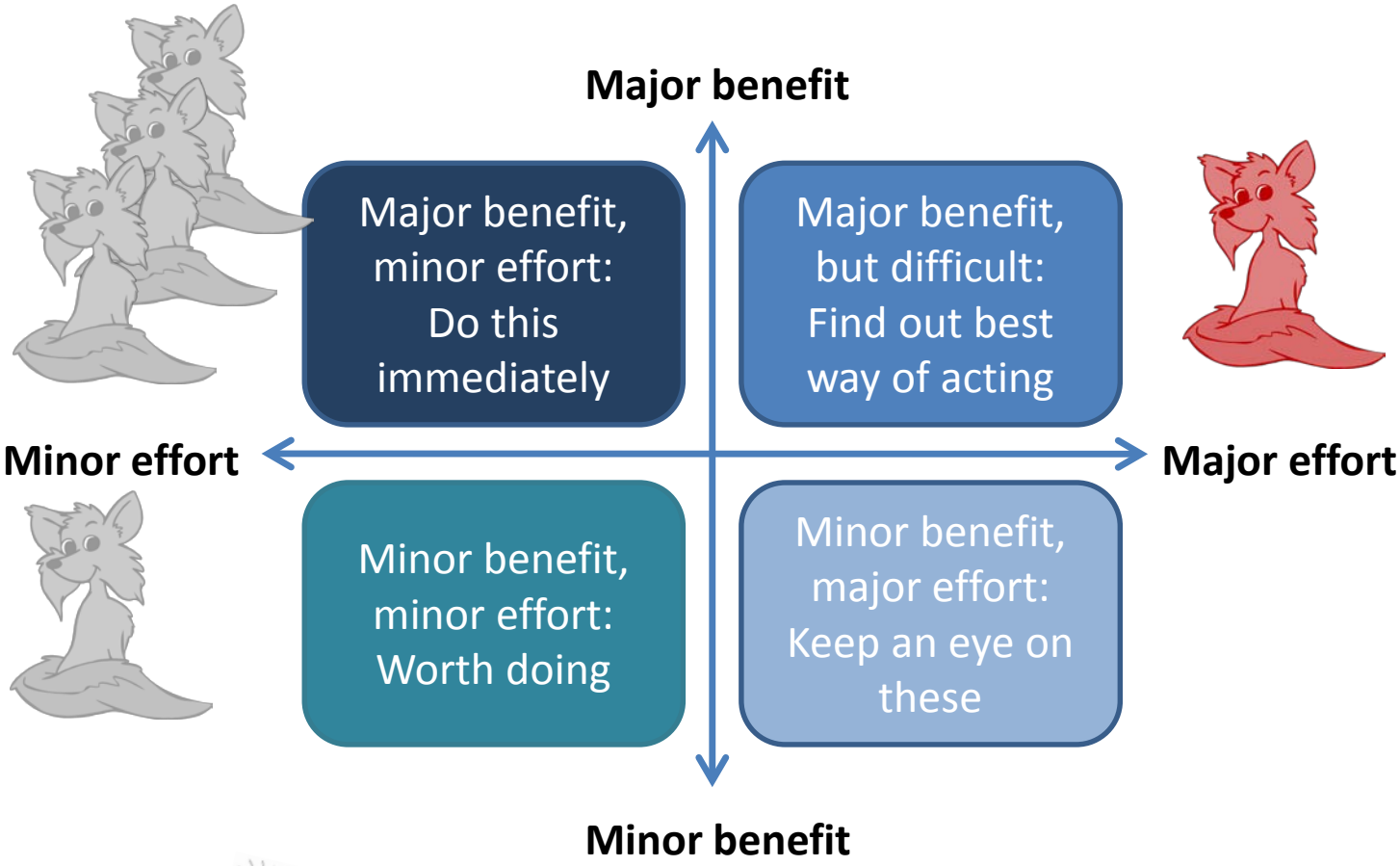
Priorities



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Part 1

Change for safety in four steps

Could we achieve the same target without chemicals?

Could we achieve the same action with another chemical?

Could we make the use/ process safer?

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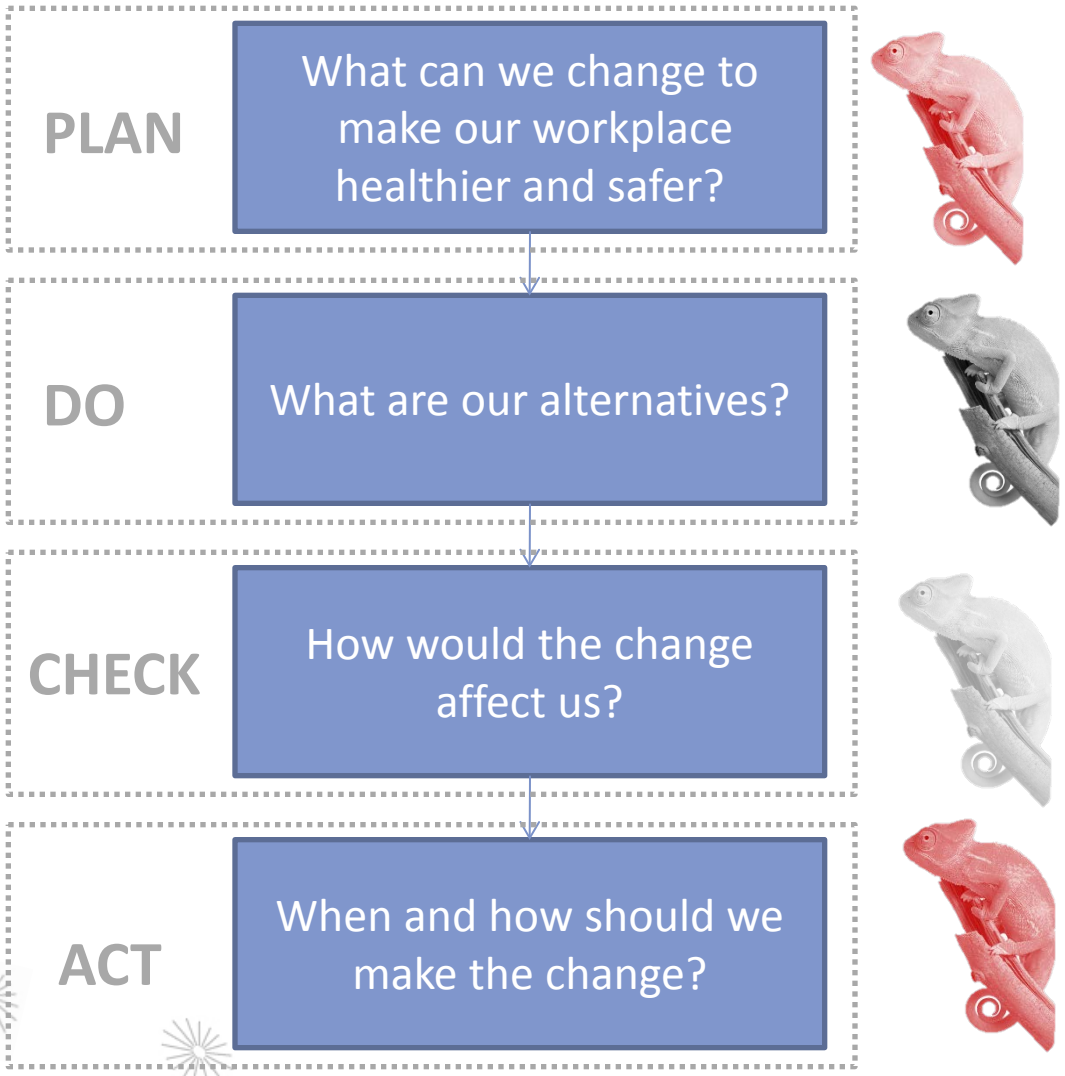
Four step process overview



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A. PLAN

- There are four phases in the PLAN step, each helping to find the answer to the following questions:

I. What are the chemical hazards?
II. How are the chemicals used?
III. How could this harm workers?
IV. What are the risks and are these too high?
V. What can be changed to reduce the risk?

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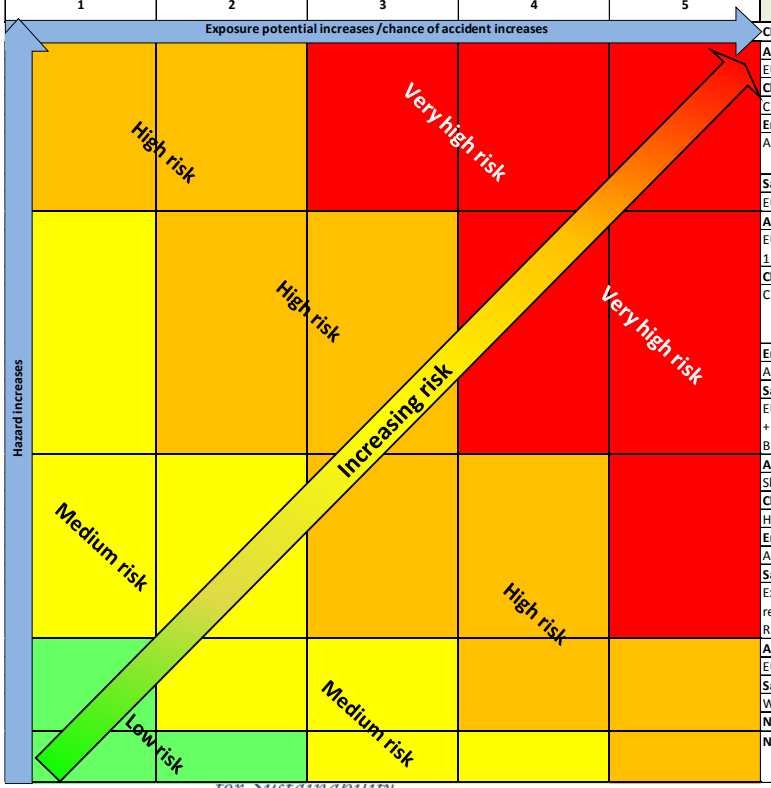
Very unlikely, 1	2	could happen, 3	4	very likely, has happend before,5
Very small				Large
(e.g. grams/millilitres)		(e.g. kilograms/litres)		(e.g. tonnes/cubic metres)
Liquids with low vapour pressure		Liquids with medium vapour pressure		Gases
Non-dust-generating solids		Medium dustiness (e.g. granular or crystalline)		Liquids with high vapour pressure
				High dustiness (e.g. fine solids and light powders)
Closed system		Closed system, with possibility of exposure in open working when e.g. decanting or sampling		Open system
->No possibility of direct skin contact				->Possibility of direct skin contact
->No possibility of exposure by inhalation				->Possibility of exposure by inhalation
Occasional/ short		Frequent		Continuous/ long
1	2	3	4	5

[Disclaimer and important note to users!]

This general risk matrix has been prepared for helping companies in risk assessment. However, it should be noted that the risk matrix does not represent an absolute truth, nor is it the only way of ranking different hazards and potentials for exposure. Within each company, relative risk may be considered differently. You can use this model to construct your own definition of a risk matrix. If you do this, you should think carefully about at least the following: How do we rank different types of hazards in relation to each other? Are, for example, environmental hazards as important in overall risk as chronic health hazards? You can also use different risk matrices for different types or risk, such as inhalation, skin and eyes, ingestion, chronic health effects, safety effects and effects on environment.

MAKE SURE YOU CHECK WHETHER THERE ARE LEGAL REQUIREMENTS OR DEFINITIONS OF RISK LEVELS IN YOUR COUNTRY!



CLP system	Risk matrix
Acute hazards: EUH032, Acute Tox. 1 + H330 or H310, Acute Tox. **Chronic health hazards:** Carc. 1A and Carc. 1B + H350 or H350i, Repr. 1 **Environmental hazards:** Aquatic Acute 1 + H400, Aquatic Chronic 1 **Safety hazards:** EUH001, EUH006, Pyr. Liq. 1 + H250, P	5
Acute hazards: EUH029, EUH031, EUH071, EUH20 1 + H318, Skin Corr. 1A + H314, S **Chronic health hazards:** Carc. 2 + H351, Muta. 2 + H34 **Environmental hazards:** Aquatic Chronic 3 + H4 **Safety hazards:** EUH014, EUH018, EUH0 + H225, Flam. Aerosol 1 + B + H241, Compressed gas,	
Acute hazards: Skin Corr. 1B or 1C + H314, Ac **Chronic health hazards:** H362, STOT RE 2 + H373 **Environmental hazards:** Aquatic Acute 3. + H402 **Safety hazards:** Expl. 1.4 + H204, Expl. 1.6, Flam. Gas 2 react. CD or Org. Perox. CD + H242, Self-r Refrigerated liquefied gas + H281, Met. Co	3
Acute hazards: EUH066, EUH210, STOT SE 3 + H335 or H336, **Safety hazards:** Water-react. 3 + H261, Ox. Liq. 3 or Ox. Sol. 3 + H **Not in CLP (in GHS)**:H227, H303, H305, H313, H316,	2
No Hazard statements	1

the guidance would benefit from internet version or tools. Need to be a matrix that is “approved”

More detail

1: Look at Safety Data Sheet

2:What are the hazards?

3: Find the hazard in Risk Matrix (Appendix 3)

4: The chemical hazard level is the same as the category of the hazard

Skin Corr IB, H314

5	**Acute hazards:** EUH032, Acute Tox. 1 + H330 or H310, Acute Tox. 2 + H330 or H300, STOT SE 1 **Chronic health hazards:** Carc. 1A and Carc. 1B + H350 or H350i, Repr. 1A and Repr. 1B + H360, H360 H360Fd or H360Df, Muta. 1A and Muta. 1B + H340 **Environmental hazards:** Aquatic Acute 1 + H400, Aquatic Chronic 1 + H410, Aquatic Chronic 2 + **Safety hazards:** EUH001, EUH006, Pyr. Liq. 1 + H250, Pyr. Sol. 1 + H250, Unst. Expl. 1.2 + H202
	Acute hazards: EUH029, EUH031, EUH071, EUH207, Lact. + H362, Acute Tox. 3 + H H304, R, Eye Dam. 1 + H318, r H361fd, 2 + H401 H205, Ox. Liq. H225, Flam. Aeros elf-react. A or Org. Pero uefied gas or Dissolved gas + H
3	**Acute hazards:** Skin Corr. 1B or 1C + H314, Acute Tox. 4 + H332, H312 or H302, EUH201, EUH201A, EUH202, EUH203, EUH204, EUH205, EUH206, EUH208, EUH401 **Chronic health hazards:** H362, STOT RE 2 + H373 **Environmental hazards:** Aquatic Acute 3. + H402 **Safety hazards:** Expl. 1.4 + H204, Expl. 1.6, Flam. Gas 2 + H221, Flam. Sol. 2 + H228, Flam. Liq. 3 + H226, Flam. Aerosol 2 + H223, Ox. Gas 1 + H270, Self-heat. 2 + H252, Self-react. CD or Org. Perox. CD + H242, Self-react. EF or Org. Perox. EF + H242, Self-react. G, Org. Perox. G, Water-react. 2 + H261, Ox. Liq. 2 or Ox. Sol. 2 + H272, Refrigerated liquefied gas + H281, Met. Corr. 1
2	**Acute hazards:** EUH066, EUH210, STOT SE 3 + H335 or H336, Skin Irrit. 2 + H315, Eye Irrit. 2 + H319 **Safety hazards:** Water-react. 3 + H261, Ox. Liq. 3 or Ox. Sol. 3 + H272, EUH209, EUH209A **Not in CLP (in GHS):** H227, H303, H305, H313, H316, H320, H333
1	**No Hazard statements**

Guidance would benefit from internet version of tools

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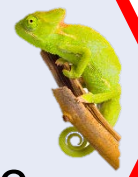
What kind of chemicals do we use, When, how and by whom?

Table II-1: Describing chemical use (with fictional example)

DEFINE CHEMICAL USE	THINK about:	EXAMPLE: Paint stripping (fictional) 
People	Who uses the chemical?	Painters
	Are there other people who could come in contact with the chemical?	Customers may be present when used
Process or task	What is done?	Paint stripping
	How is it done?	Apply chemical to surface, scra
	When is it done?	In renovation projects
Premise/ area	Where is the chemical used?	Customers premises, variable
Plant, equipment, tools	With what is the chemical used?	Brushes, scrapers, rags
Exposure type	How could the chemical cause harm to workers?	Breathing fumes Contact with skin, eyes
Exposure potential	How likely is it that the chemical could cause this harm?	Breathing fumes is likely, no mask used Contact with skin if spilled, gloves and overall are used Contact with eyes less likely, safety goggles are worn and the chemical is fairly thick so does not splash very readily
Environment	Waste	Tins containing liquid remnants of the paint and solvents used for washing the equipment are hazardous waste
	Discharges	Remnants into sewage when washing equipment with water
	Emissions	Fumes

Forces the thought process towards the essential



Completing this type of table does not yet give you an indication of risk, but it will help you recognise all the aspects you need to pay attention to

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Exposure

Table II-2: An example of a categorisation of exposure potential

Very low	Low	Medium	High	Very high
Very unlikely that breathing chemical, fumes or dust would occur Very unlikely that contact with skin, eyes or mouth would occur	Unlikely that breathing chemical, fumes or dust would occur Unlikely that contact with skin, eyes or mouth would occur	Breathing of chemical, fumes or dust could occur Likely that contact with skin, eyes or mouth could occur	Likely that ing of fumes o occur Likely with sk mouth wi	that of or n, will

Subjective. Would benefit from industry specific examples

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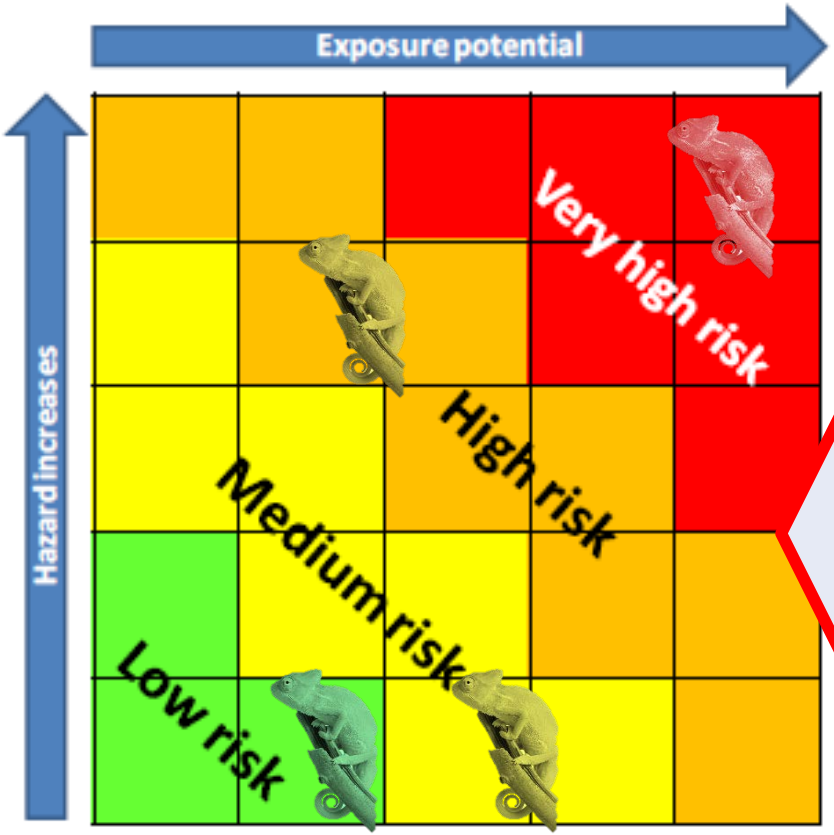
Risk assessment



Tools that combine hazards with exposure can be used

Figure II-2: An example of a risk matrix

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What can be changed to reduce the risk?

Helps the expert/ responsible person to present the case to management

Table II-3: Check-list for setting margins for change

QUESTION	ANSWER	REASONS for answer; notes on whether more data is needed and what type of data.
Could we do without the chemical or the work task?		Ask yourself - Why are we using the chemical? What are the benefits? Is it necessary to do this? Are there any other ways we could work? How much profit do you make from this? If the profit is marginal or the task is not vital for your business, you could consider it to be the best option to stop doing this task.
What can we change?		Look at the way you are using the chemical and identify what you can and cannot change. Make a list of the requirements for effectiveness and compatibility you have to meet. The more details on specific requirements you list, the easier it will be to compare performance of alternatives.
What type of limits does the materials used set for change?		Material requirements relate specifically to any materials the chemical will be in contact with. If you are painting metal roofs, you cannot use paint that is not intended for metal, nor can you use paints that cannot withstand outdoor conditions for a long time. The requirements are then simply "must work on metal and must withstand weather".
Are there any time re-straints?		Time restrains define the length of time the process or task can take to meet customer or market demands. If your processes are set up in such a manner that for example degreasing a surface has to be performed in a maximum of 30 minutes in order to allow the next stage to take place, any changes will have to allow this time limit to be met.
How does the chemical have to perform? Are there any specific re-quirements?		Note down the requirements for what the chemical should do. Remember to check whether your clients have any specific requirements. If you need to clean a fatty or oily surface, you will need to use cleaners that remove grease. The performance requirement is then "must remove grease".
The way we control the risk now – what can be changed?		Check if the existing control measures restrict the choice of alternatives. Note down any limitations of for example ventila-tion systems, filters or discharge controls as well as for example measuring devices calibration or renewal needs.
Are there any limits related to waste disposal?		Are there any specific limitations from waste disposal or envi-ronmental permits that must be considered? For example, if you have to meet certain permit criteria, you cannot perform worse in that area. However, you are always allowed to do better.

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B. Do "Alternatives"

- **Make a list of alternatives.** Talk to your supplier and/or other suppliers, your workers and industry association to get ideas on innovative products or working methods that could reduce risk as well as information on alternatives. Your authorities are also a good source of ideas on safer ways of working – it is their job to help you be as safe as possible so you should feel free to ask. Look at different types of changes to decide what your alternatives could be.
- **Check the alternatives against the requirements** and narrow down your options.
- **Find the alternatives that best meet the requirements**. Remember to think about if the change could affect any other tasks or processes so that you do not end up increasing other risks.
- **Test the alternative and see how well it performs.** Are you satisfied the end result will meet all requirements? Involve the people who do the actual work in the testing - their feedback on practical impacts will be valuable.
- **Decide which alternatives meet the performance requirements**. If none of the alternatives does this, you may have to look for other alternatives or consider reducing the risk some other way.

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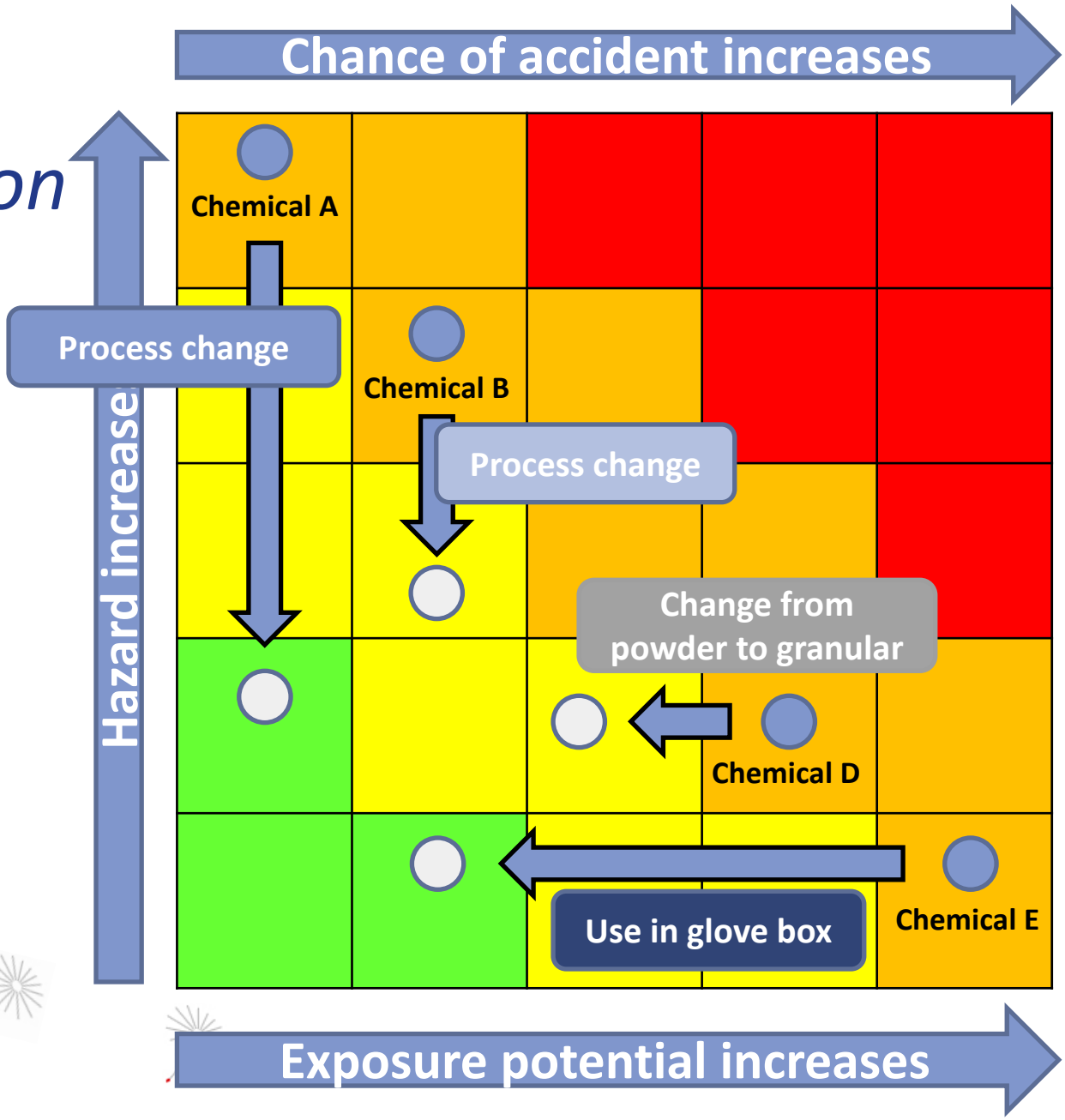
C: CHECK Compare the alternatives

Compare alternatives: Will change make it healthier and safer?	**Current**	**Alternative**
Hazard: Are there differences in hazard? ()	Higher	
Exposure: Is it possible that we breath the chemical or get it on our skin/eyes/mouth during normal use?	Yes	Yes
Exposure time: How often do we use this chemical?	Same	Same
Risk: Are there differences in risk (see matrix xx)	High	Medium
Protection: Are there more control measures or PPE needed for either?	Yes, this one	
Other risks: Are there other risks from this use, e.g. vibration, noise, strains etc.	Yes, strains	Yes, noise slightly higher; strains less
Which is healthier /safer?		**This one**
Compare other benefits and drawbacks	**Current**	**Alternative**
Legislation: Are there any legal obligations for this chemical that impact on us, and what	**Yes, carcinogen**	**No**
Costs: What are the material costs?	1000 €	1050 €
Costs: What would the change to alternative cost? potential changes in equipment, PPE, training needed, storage requirements etc.	NA	100 €
Time: How long does it take to do the task done with the chemical?	30 min	25 min
Supply – is the supply secure , i.e. will we get this chemical when we need it?	Yes	Yes
Waste: Does the use of the chemical create wastes that need special treatment? (YES / NO)	Yes	Yes
Which is better?		**This one**
Change or not?		**YES**

Example of comparison



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D: Act Plan the change carefully.

This will help you minimise any risks.

- ✓ Make a list of who needs to know about the change and what training is needed.
- ✓ Check if you have to make special arrangements for deliveries.
- ✓ Check if there are any particular risks during the change that you need to take into account.
- ✓ Inform management, workers and other persons involved about any potential new risks and safety measures.
- ✓ Talk to sales and marketing to see if the change will affect them. They may need new sales material or have to know if the delivery of products or services might be affected for a time.
- ✓ Make sure you do not run out of stock for the old process/task during the change period.
- ✓ Make sure that any old chemical stock is removed from storage areas.
- ✓ Check and update process descriptions, quality assurance procedures or other management systems before you make the change. Document the process, delayed options and reasons for change.
- ✓ Make sure that customers know and accept the chance.

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7-step process

This **part of the guidance contains the more detailed 7 step process.** Use this approach if:

- You have at least some experience of chemical risk assessment and management
- If you want a detailed assessment of the potential for substitution
- f the process or task where the chemical is used is more complex.

The 7 step process allows you to consider substitution thoroughly and systematically. Working through the process will help you achieve practical and effective change management.

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Change for safety

0. Is this for us?

PLAN	1. Assess the risks 2. Check the need for reducing risks 3. Establish requirements that have to be met
DO	4. Look for alternatives
CHECK	5. Check the consequences of a change
ACT	6. Decide on change 7. Decide on how and when to implement & implement

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A more ”engineering” type of solution

HOW TO CHECK THE NEED TO REDUCE RISK

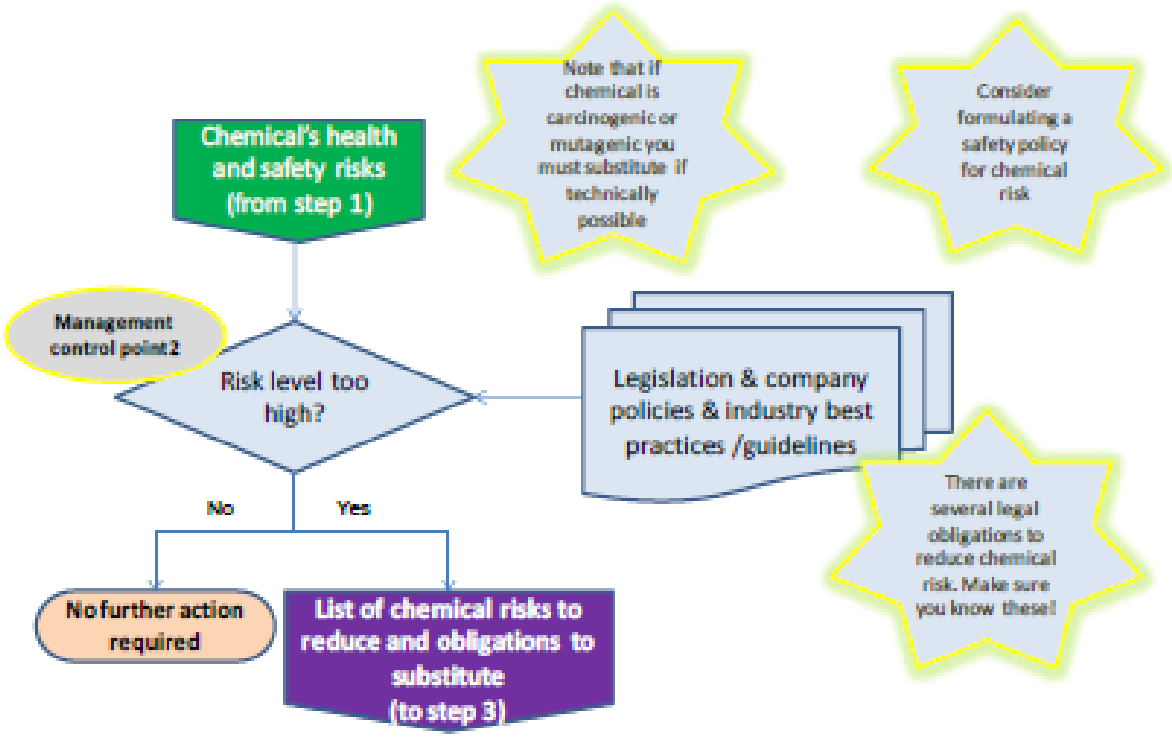

Figure III-5: Flow chart for Step 2

More details and more need for expert input. Beneficial to include supply chain.

HOW TO ASSESS MARGINS FOR CHANGE

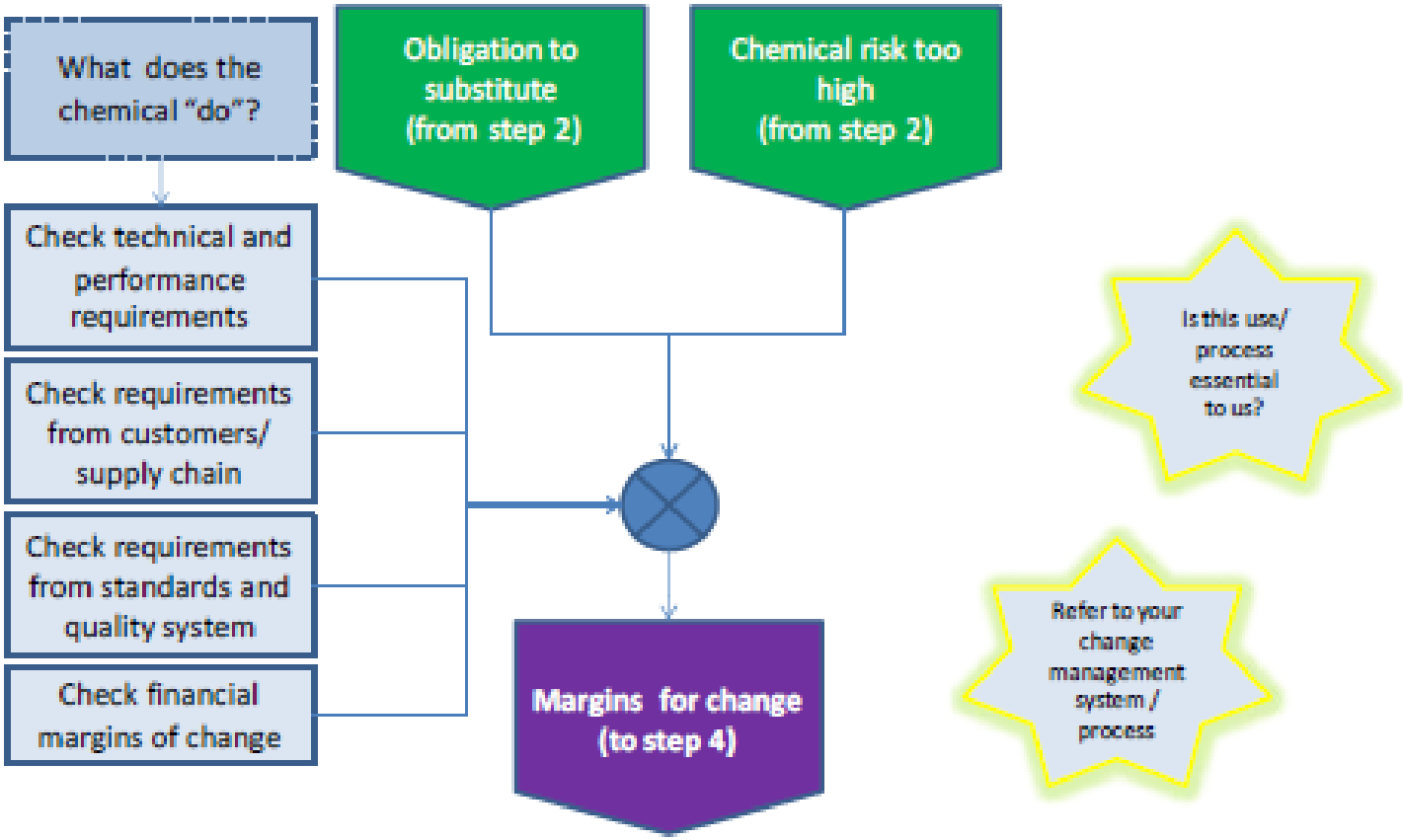

Figure III-7: Flow chart for Step 3

Notes on usability

Gaia views and notes only

Not official in any way or means

DG Employment, Social Affairs and Inclusion hopes that this study and the associated guidance document will contribute to the development of a decision making framework which will consider all the relevant aspects of implementing the principle of substitution at the workplace *DG Employment, Social Affairs and Inclusion hopes that this study and the associated guidance document* ***will contribute to the development of a decision making framework*** *which will consider all the relevant aspects of implementing the principle of substitution at the workplace*

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Positive feedback

Easy to use

Good results

- Clear and easy to work
  - But sustainable chemical management is our profession…
  - Companies we have taken the steps with seem were pleased with process and results
  - Specifically the shorter 4 step process has been appreciated
    - Found carcinogens, high hazard chemicals as well as unsafe ways of using chemicals in large, non-chemical industry companies.

- Drives recognition of substitution as a worthwhile risk reduction and management measure.
  - Clarifies and promotes the use of substitution as a risk management measure.
  - Brings chemical risk management on to a level that **supports management decisions**
    - All found high risk chemicals have been substituted or the process changed
  - Emphasises substitution as a common sense management measure

Impact

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Future potential work

Need polish

Separate documents

Generic

Country

- Guidance is published as part of the overall study
  - Would benefit from polishing e.g. lay-out and graphic design
  - Current edition contains unreadable pages (e.g. straight copy paste from excel)
  - Document is lengthy: No SME is going to read a over 300 page document
- Intended as a baseline for industry or country to work from
  - Current version need reworking from specific industry point of view in order to increase the impact
  - Country authorities could also carry work forward and truly make the guidance applicable, practical and easy to follow for the SMEs in that country

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Next steps wish list

- ✓ Provide the tools in electronic format
- ✓ Provide working linkages to use the available risk assessment tools such IF these are simple enough (difficult ones will scare the people away)
- ✓ Tailor the guidance towards industries or professions
- ✓ Promote usage by authorities in each country

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Reducing Hazardous Chemicals in the Workplace: OSHA's Safer Chemicals Toolkit

Interagency Alternatives Assessment Webinar

December 9, 2013

OSHA Occupational Safety and Health Administration

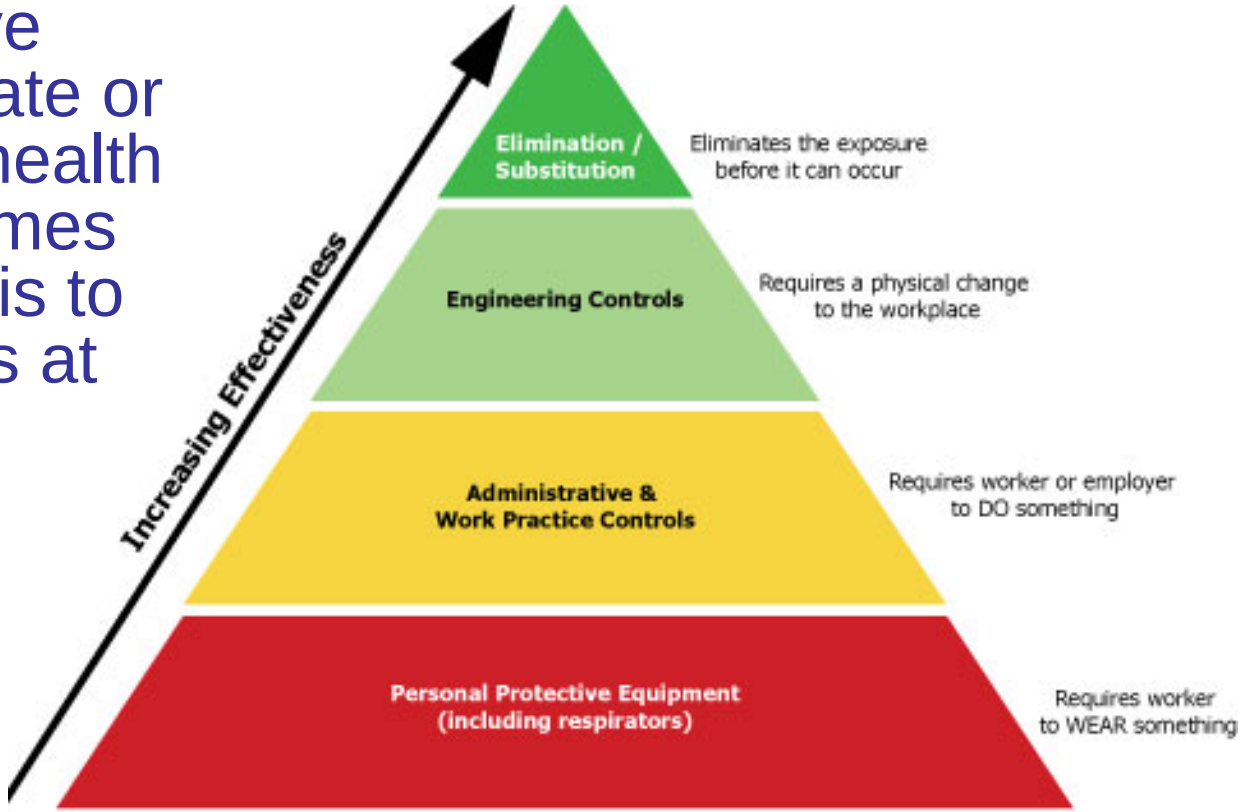
Chemical Use in the Workplace

- Chemicals play a valuable role in economy
- Many OSHA PELs are outdated and do not adequately protect workers
- Goal: Chemical use that is safer for workers and better for business

OSHA
adds value to business, work and life

Chemical Management Strategies

- The most effective method to eliminate or reduce adverse health and safety outcomes in the workplace is to eliminate hazards at the source.



OSHA adds value to business, work and life

Safer Chemicals Toolkit

- Compiles existing tools and methods to help employers effectively accomplish elimination and substitution

https://www.osha.gov/dsg/safer_chemicals/

OSHA adds value to business, work and life

Contact Information

Questions?

Rebecca Reindel, MS, MPH
OSHA Standards and Guidance
reindel.rebecca@dol.gov

Jessica Schifano, JD, MPH
OSHA Standards and Guidance
schifano.jessica@dol.gov

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Discussion Questions

Lowell Center for Sustainable Production
UNIVERSITY OF MASSACHUSETTS LOWELL

- What are the key steps of a substitution assessment process to protect workers from chemical hazards?
- How can these tools help employers avoid regrettable substitutions?
- How can employers and workers obtain necessary resources to apply these tools.
- What successes and challenges are faced in attempting to use/apply these tools and in substitution in general?

Next Webinars

Lowell Center for Sustainable Production
UNIVERSITY OF MASSACHUSETTS LOWELL

Alternatives Assessment 117:
Challenges in Selecting Alternatives and Implementing Substitution – Cross Agency Perspectives

Thursday, December 19 2013 at 12pm Eastern/9am Pacific

- Alissa Cordner, Whitman College
- Chris Weis, NIEHS (Invited)
- Paul Yaroshak, US Department of Defense
- Treye Thomas, CPSC

Webinar Audio & Slides

Lowell Center for Sustainable Production
UNIVERSITY OF MASSACHUSETTS LOWELL

The audio recording and slides shown during this presentation will be available at:

http://www.chemicalspolicy.org/alternativesassessment.webinarseries.php