



# Substitution and phasing-out

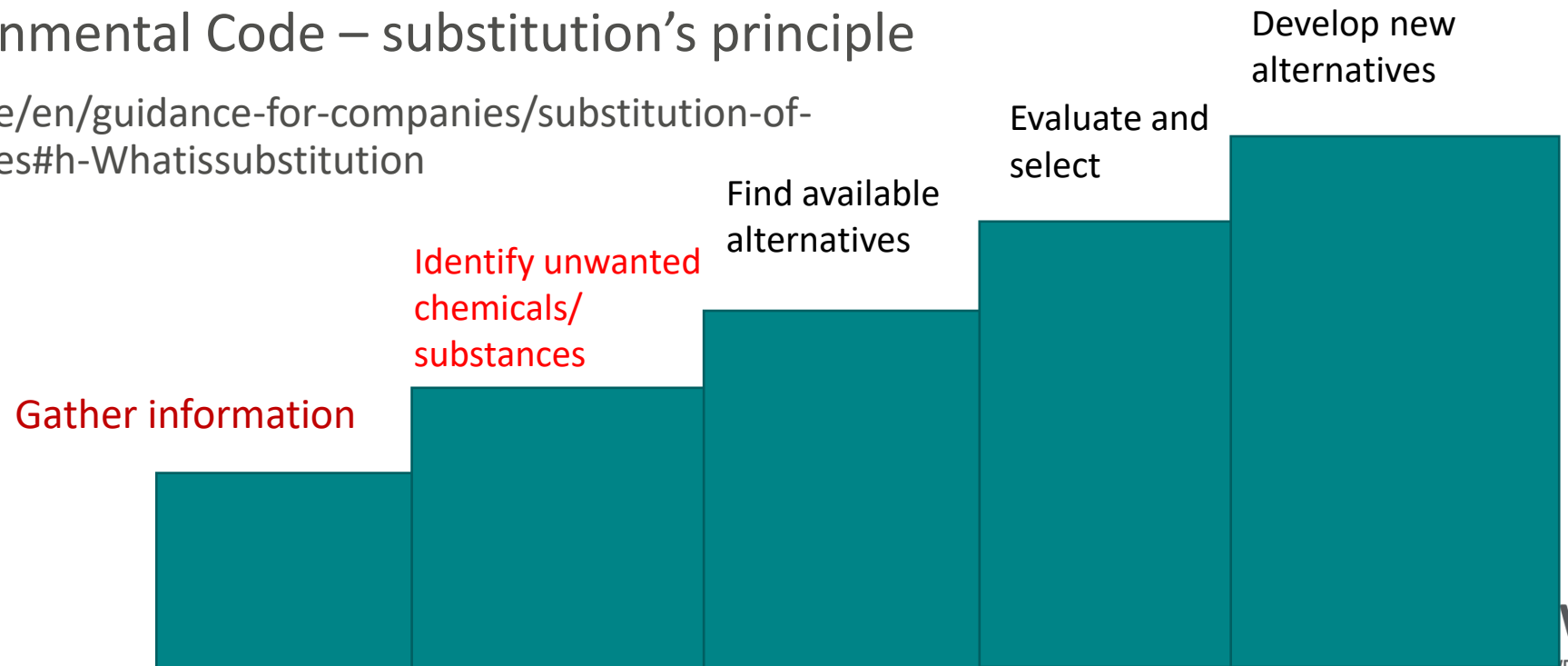
- Endocrine Disrupting Substances

# Agenda:

- Substitution
- Examples of tools to use
- Examples of Lists with Endocrine Disruptors
- Short tips on substitutes finding
- Broader picture: frameworks, role of companies producing
- Extra links and resources as examples included!

# Substitution

- To eliminate (or replace) hazardous chemicals in products or processes with less hazardous or non-hazardous substances.
- Swedish Environmental Code – substitution's principle
- <https://www.kemi.se/en/guidance-for-companies/substitution-of-hazardous-substances#h-Whatissubstitution>



# SIN list (Substitute It Now)

- 32 substances that have been placed on the SIN List due to ED properties
- <https://sinlist.chemsec.org/endocrine-disruptors/>

Name	CAS
Di-n-octylphthalate, DnOP	117-84-0
Diisodecylphthalate, DiDP	68515-49-1, 26761-40-0
Diundecyl phthalate, DuDP	3648-20-2
Dicyclohexyl phthalate, DCHP	84-61-7
Diethyl phthalate, DEP	84-66-2
Dihexyl phthalate, DHP	84-75-3
Bisphenol S, BPS	80-09-1
Bisphenol F, BPF	620-92-8
4,4'-dihydroxybenzophenone	611-99-4

Home

What is the SIN List?

How to use the SIN List

Chemical groups

Focus: PFAS

Focus: Endocrine  
disruptors

Focus: Nanomaterials

The science behind

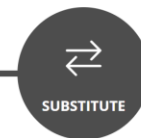
Updates



## Endocrine disrupting chem

Endocrine Disrupting Chemicals (EDCs) are hormones in humans and other animals. The events in life such as growth, metabolism, and disturbed, it can cause a wide range of health diabetes, infertility, and cognitive disorders.

Source: <https://sinlist.chemsec.org/endocrine-disruptors/>



# PRIO - hazard based tool by the Swedish Chemicals Agency

- Two priority levels:
  - *phase-out substances*
  - *priority risk-reduction substances.*

Criteria for the PRIO substances are based on the environmental quality objective A Non-Toxic Environment (the Swedish government) and on the EU REACH

Search for properties hazardous to human health and the environment

How hazardous is your substance? To assess whether a substance is hazardous, you may search the PRIO database. When assessing the hazard of a chemical, it is the inherent properties of the substance that are important, for example whether the substance is toxic, allergenic, or persistent. You can find out if the substance has any hazardous environmental and health properties and if the substance falls under PRIO's

The screenshot shows the PRIO search interface. At the top, there are tabs for 'Standard', 'Batch', and 'Advanced'. Below the search bar, the text 'Bis(2-ethylhexyl) phthalate' is entered. The search results show one result for 'Bis(2-ethylhexyl) phthalate' with a priority level of 'Phase-out substance' and criteria of 'Endocrine disrupting / Toxic to reproduction (category 1A or 1B)'. The search results are highlighted with a yellow circle.

Standard Batch Advanced

Bis(2-ethylhexyl) phthalate Clear search Search

[Export the entire database to Excel](#) [Latest changes to the database](#) [Export the search result to Excel](#)

The database was updated 2024-11-07

Search: Bis(2-ethylhexyl) / phthalate

Search is showing 1 - 1 of 1 results

Sort: Substance name CAS-nr EG-nr Priority level Criteria

**Substance** Bis(2-ethylhexyl) phthalate

**name:** CAS-nr: 117-81-7 EG-nr: 204-211-0

**Priority level:** Phase-out substance

**Criteria:** Endocrine disrupting / Toxic to reproduction (category 1A or 1B)

Source:  
<https://www.kemi.se/prioguiden/english/start>

# PRIO – Prioritizing yours chemical for substitution

## Phase-out

Standard Batch Advanced

Bis(2-ethylhexyl) phthalate Clear search Search

[Export the entire database to Excel](#) [Latest changes to the database](#) [Export the search result to Excel](#)

The database was updated 2024-11-07

Search: Bis(2-ethylhexyl) / phthalate

Search is showing 1 - 1 of 1 results

Sort: Substance name CAS-nr EG-nr Priority level Criteria

	<b>Substance</b>	Bis(2-ethylhexyl) phthalate
	<b>name:</b>	CAS-nr: 117-81-7 EG-nr: 204-211-0
	<b>Priority level:</b>	Phase-out substance
	<b>Criteria:</b>	Endocrine disrupting / Toxic to reproduction (category 1A or 1B)

## Prioritize?

### Priority risk-reduction:

- Hazard (inherent properties)
- Exposure (how used/handled)

### Analyze risks

### Address the risks

### Tips: Review regularly risks

### Source:

<https://www.kemi.se/prioguiden/english/prioritise>

# Lists with EDs, examples

- Lists with substances identified as Endocrine Disruptors:
- **ED Lists EU level** (three lists), e.g. List I:  
<https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu>
- **ED list by CHEMTrust**: <https://chemtrust.org/edcs-list/>
- **List of Endocrine Disrupting Chemicals, by Hass et al. DTU**:  
[https://backend.orbit.dtu.dk/ws/files/162337566/DK\\_ED\\_list\\_final\\_2018.pdf](https://backend.orbit.dtu.dk/ws/files/162337566/DK_ED_list_final_2018.pdf)

# Swedish Center for Substitution

- Substitution guide
- <https://www.ri.se/en/centre-chemical-substitution/substitution-guide>

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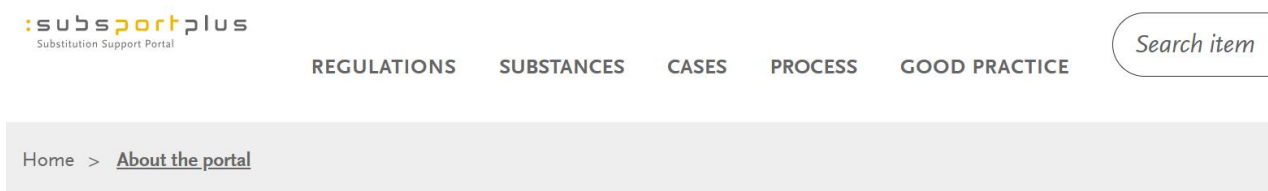
Home → Centre for Chemical Substitution → How to phase out chemicals → The Substitution Guide

## The Substitution Guide

**Our Substitution Guide provides a step-by-step approach to help companies systematically phase out hazardous chemicals.**



# SUPSPORT – substitution Support Portal



## About the portal



The SUBSPORTplus Portal is the result of the → SUBSPORT PROJECT and aims to be a reliable source of information regarding safe alternatives for hazardous substances. Here you have access to recent

- SUBSPORTplus
- Regulations
- Database – hazardous substances
- Overview of criteria
- Substitutions tools
- Cases and case studies
- Good practice

Source:  
<https://www.subsportplus.eu/subsportplus/EN/Home>

# Finding substitute?

- <https://marketplace.chemsec.org/>



chemsec  
**MARKETPLACE**  
Quick search alternative

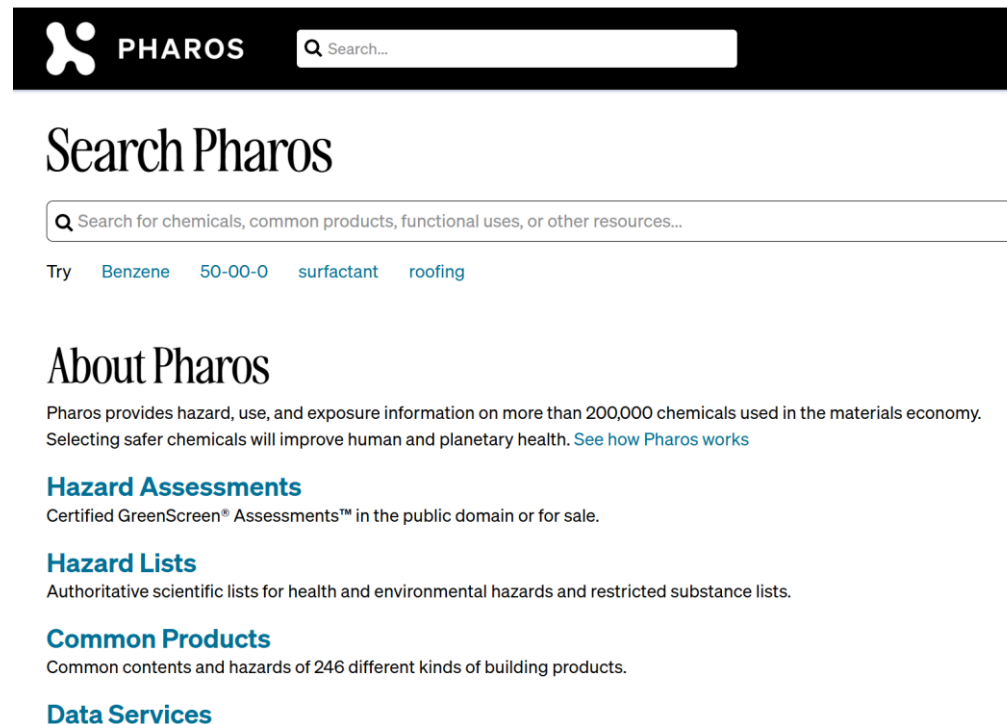
**Future-proof your business**  
Find safer alternatives to hazardous chemicals

Marketplace gathers all green chemistry innovations in one place, making it easier for companies to choose safer solutions. Search advertisements of safer alternatives and connect with suppliers.

## ECHA Guideline - Substances of concern: Why and how to substitute?

([https://echa.europa.eu/documents/10162/3079426/why\\_and\\_how\\_to\\_substitute\\_en.pdf/93e9c055-483c-743a-52cb-1d1201478bc1](https://echa.europa.eu/documents/10162/3079426/why_and_how_to_substitute_en.pdf/93e9c055-483c-743a-52cb-1d1201478bc1))

- <https://pharos.habitablefuture.org/>



PHAROS Search...

## Search Pharos

Search for chemicals, common products, functional uses, or other resources...

Try [Benzene](#) [50-00-0](#) [surfactant](#) [roofing](#)

### About Pharos

Pharos provides hazard, use, and exposure information on more than 200,000 chemicals used in the materials economy. Selecting safer chemicals will improve human and planetary health. [See how Pharos works](#)

#### Hazard Assessments

Certified GreenScreen® Assessments™ in the public domain or for sale.

#### Hazard Lists

Authoritative scientific lists for health and environmental hazards and restricted substance lists.

#### Common Products

Common contents and hazards of 246 different kinds of building products.

#### Data Services

# Substitution and phasing-out as companies' strategy?

- Work with decision-making frameworks
- Alternative evaluation as iterative process (work with alternative assessment)
- Life-Cycle thinking might help to identify “red flags”
- Avoiding regrettable substitution!

# Chemicals production – shift towards more sustainable solutions

- EU Chemicals Strategy,
- Safe and Sustainable by Design (SSbD) EDs are addressed
- **Research initiatives (green chemistry) providing tools for industry/stakeholders/developing safer products(e.g. Mistra SafeChem: Toolbox**  
<https://mistrasafechem.se/projekt/mistra-safechem/toolbox.html> )

- *Role of in-silico tools*

# Interesting /good to know

- **EU REACH - alternatives**  
(<https://echa.europa.eu/sv/alternatives-to-harmful-substances-subject-to-authorisation>) →  
*an Excel list with alternatives can be downloaded*
- **Safe and sustainable by design** ([https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/chemicals-and-advanced-materials/safe-and-sustainable-design\\_en](https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/chemicals-and-advanced-materials/safe-and-sustainable-design_en))
- **US EPA Safer Choice Program**  
(<https://www.epa.gov/saferchoice>)
- **ToxCast program – EPA - screening for Eds:**  
<https://www.epa.gov/comptox-tools/toxicity-forecasting-toxcast>

# Might be of interest?- Examples

- Malloy et al., (2017). Advancing Alternative Analysis: Integration of Decision Science, EHP, 125, 16 <https://doi.org/10.1289/EHP483>
- Caldeira C., et al. (2024). Safe and sustainable chemicals and materials: a review of sustainability assessment frameworks, Green Chemistry, 26, 13, 7456-7477 DOI: 10.1039/D3GC04598F,
- Zheng, Z. et al., (2021) Environmental Science & Technology 2021 55 (2), 1088-1098 DOI: 10.1021/acs.est.0c02593
- UCLA Multi-Criteria Decision Analysis: MCDA method
- *Alternatives Assessment at the IC2* (<https://www.theic2.org/programs/alternatives-assessment/> )
- *The BizNGO Chemical Alternatives Assessment Protocol* (<https://www.bizngo.org/alternatives-assessment/chemical-alternatives-assessment-protocol>)



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## Safe and sustainable chemicals

The chemical industry is facing major changes to reduce its climate impact and create

# IVL, Safe and Sustainable Chemistry

Monika.Witala@ivl.se

<https://www.ivl.se/english/ivl/our-offer/our-focus-areas/chemicals.html>

