

The landscape of tools to support the transition to safer chemicals: lessons learned

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Finding Safer Alternatives

Substitution is not just tools, it's a process

- **Substitution:** “the replacement or reduction of hazardous substances in products or processes by less hazardous or non-hazardous substances, or by achieving an equivalent functionality via technological or organizational measures”
- Significant growth over the last decade in the methods, tools and resources to support substitution
- Tools designed to serve substitution planning and assessment processes
 - The goal is: Informed Substitution

Function Matters

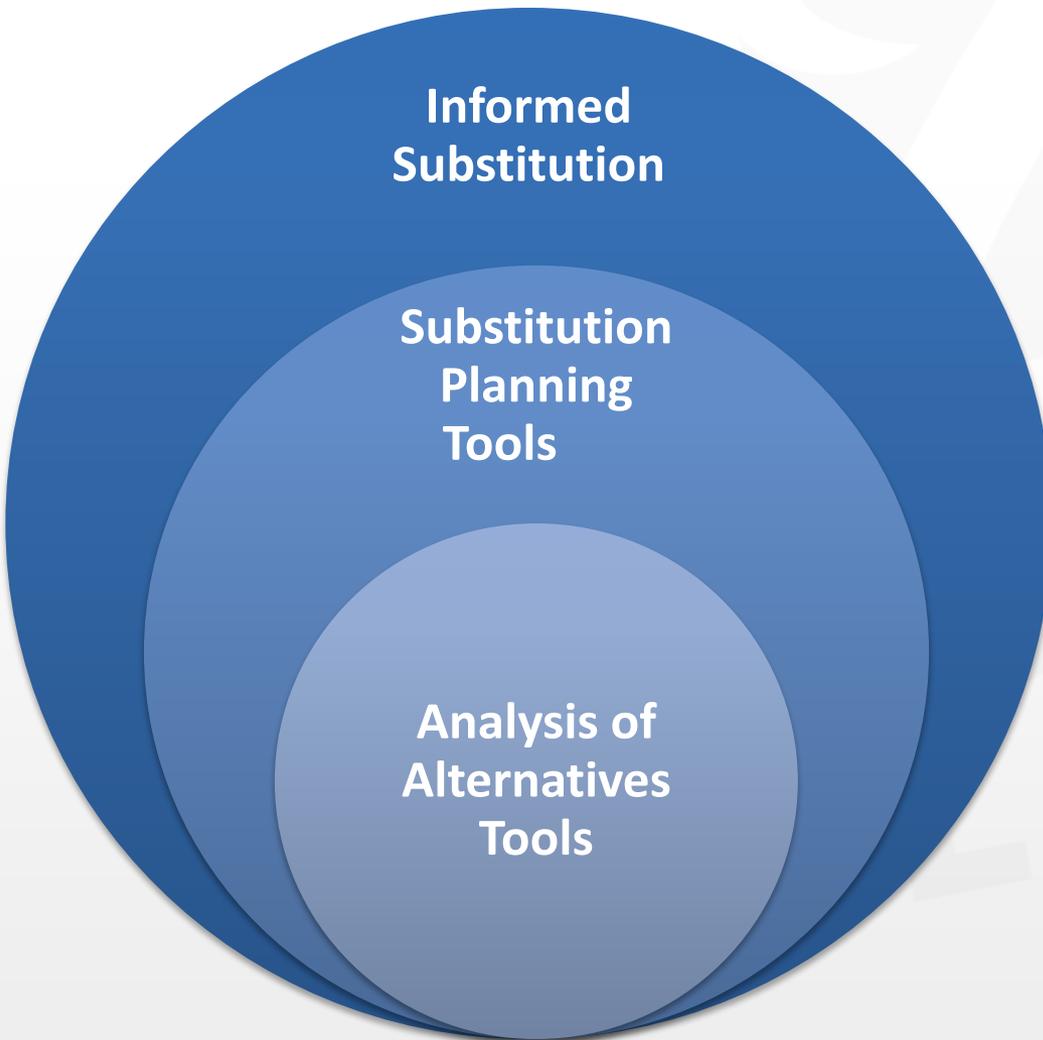
Advancing Innovative Substitution

Functional Substitution Level	Chemical in Product Bisphenol-a in Thermal Paper	Chemical in Process Methylene Chloride in Degreasing Metal Parts
Chemical Function (Chemical Change)	Is there a functionally equivalent chemical substitute (i.e., chemical developer)? Result: Drop-in chemical replacement	Is there a functionally equivalent chemical substitute (i.e., chlorinated solvent degreaser)? Result: Drop-in chemical replacement
End Use Function (Material, Product, Process Change)	Is there another means to achieve the function of the chemical in the product (i.e., creation of printed image)? Result: Redesign of thermal paper, material changes	Is there another means to achieve the function of the process (i.e., degreasing)? Result: Redesign of the process (e.g., ultrasonic, aqueous)
Function As Service (System Change)	Are cash register receipts necessary? Are there alternatives that could achieve the same purpose (i.e. providing a record of sale to a consumer)? Result: Alternative printing systems (e.g., electronic receipts)	Is degreasing metal parts necessary? Are there other alternatives that could achieve the same purpose (i.e., providing metal parts free of contaminants for other end uses)? Result: Alternative metal cutting methods

Tickner, et al.,
Environmental
Science and
Technology,
2014



Substitution Process and Support Tools



Substitution

- **Tools** to plan and support the substitution project
- **Tools** for connecting with partners/innovators

AoA

- **Tools** for screening and comparing alternatives based on hazards, performance, and economic viability
- **Data tools** to support AoA

Landscape of Substitution Support Tools

(Not comprehensive, or mutually exclusive)

Connector tools

ChemSec's
Market Place

EEN's
Partnership
Opportunities
Database

Restricted/preferred lists

SIN List

Sector-based
lists (e.g.,
Global
Automotive
Declarable
List)

US EPA Safer
Chemical
Ingredient List

Screening tools

GreenScreen
List Translator

PRIO

RISTOX

SINimilarity

UL The Wercs

Comparative assessment tools

GreenScreen®

Quick Chemical
Assessment Tool
(QCAT)

Scivera Lens

Column Model

P2OAYSys

Data tools

ECHA data

EChem Portal

OECD QSAR
Toolbox

EPISuite

Landscape of Substitution Support Tools

(Not comprehensive, or mutually exclusive)

OECD
BETTER POLICIES FOR BETTER LIVES

HOME ABOUT RESOURCES GLOSSARY

OECD Substitution and Alternatives Assessment Tool Selector

The Tool Selector is designed to provide information on tools that are used in conducting chemical substitutions or alternatives assessments. The filters below may be used to identify tools of interest to your substitution or alternatives assessment. You can also view more in-depth information on each tool or make a side-by-side comparison of a set of tools, by selecting two or more tools from the list below.

All tools included in the toolbox address chemical hazard assessment, and may address other comparative attributes.

Tools that contain a repository of organized information but do not have a mechanism for data manipulation for outside users are flagged below as data sources using the following symbol:

For information on tools with a primary focus on non-hazard comparative attributes such as cost/benefits and availability, life-cycle impacts, and materials management, please visit the [Inventory of Non-Hazard Assessment Tools](#).

Each tool has its benefits and limitations. The user of this toolbox needs to understand the capabilities of the tools to make the most informed decisions about conducting alternatives assessments.

What's an Alternatives Assessment Tool?
A tool is an approach for evaluating a chemical, material, process, product, and/or technology for attribute analysis within a chemical substitution/alternatives assessment.

Some Lessons

- ▶ Chemical screening tools are “quick and dirty” ways to identify and avoid known chemicals of concern
 - limited in helping to identify safer alternatives and avoid regrettable substitutes
 - more useful therefore are the comparative assessment tools
- ▶ Some comparative tools provide guidance for decision-making (e.g., GreenScreen benchmarks), other tools array data and decision is left to user
 - wherever there is decision-making, transparency regarding the methods is essential
- ▶ Tools specific for the substitution/analysis of alternatives context are needed for
 - the non-hazard attributes: e.g., life cycle attributes and performance
 - comparing chemical to non-chemical alternatives

Remember the Goal: Informed Substitution

- ▶ Supporting a considered transition from chemicals of higher concern to safer, feasible alternatives
 - Using data and associated support and assessment tools to minimize the likelihood of unintended consequences when substituting a hazardous chemical without fully understanding the profile of alternatives

Thank you

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