OECD SUBSTITUTION AND ALTERNATIVES ASSESSMENT TOOLBOX (SAATOOLBOX)

Substitution under REACH, 24 November 2017, Brussels

OECD
BETTER POLICIES FOR BETTER LIVES

What is the OECD?

- The OECD provides a forum in which governments can work together to share experiences and seek solutions to common problems;
- Drawing on facts and real-life experience, we recommend policies, design tools and develop guidance to support governments on a wide range of issues.

History and Membership

- **History:** established in 1961
- **Headquarters:** Paris, France

Membership: 35 countries

Australia
Austria
Belgium
Canada
Chili
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Japan
Korea
Latvia
Luxembourg
Mexico
Netherlands
New Zealand
Norway
Poland
Portugal
Slovak Republic
Slovenia
Spain
Sweden
Switzerland
Turkey
United Kingdom
United States

Programme EHS Division

Test Guidelines Programme

Good Laboratory Practice and Compliance Monitoring

Exposure Assessment Programme

Risk Management Programme
OECD/UNEP Global PFC Group
Ad Hoc Group on Substitution and Alternatives Assessment

Hazard Assessment Programme

Pesticides Programme

Biocides Programme

Chemical Accidents Programme

Pollutant Release and Transfer Registers Programme

Harmonisation of Regulatory Oversight in Biotechnology

Safety of Novel Foods and Feeds

Safety of manufactured nanomaterials

OECD Ad Hoc Group on the Substitution of Harmful Chemicals

- Established in 2012
- **Main goal**: Furthering tools and approaches to support decision making for the substitution of chemicals of concern
- Co-chaired by the **U.S. Environmental Protection Agency** and the **European Chemicals Agency**
- Members include:
  - Government agencies
  - Industry
  - Academics
  - NGOs
- From a range of OECD countries

WHY ALTERNATIVES ASSESSMENT AND SUBSTITUTION AT THE OECD

A growing policy issue….

- Substitution feeds into current governments' strategies to reduce risks of chemicals on human health and the environment;

- Increasingly included as part of policy and regulatory measures for the management of chemicals of concern (e.g. *REACH, US Safer Choice Program; California Safer Consumer Products Regulation*);

- Also feeds into industry's approach to sustainable development.

But…. finding suitable alternatives to chemicals of concern is not a small challenge

- Alternatives should be safer, having a lower hazard and risk potential, but still present similar performance to their counterpart and be economically viable and sustainable.

- Substituting chemicals also goes beyond finding a drop-in chemical alternative and can include systems, materials, or process changes.

Work in progress

Increasingly, practitioners are asking for support on how to conduct AA and substitution in an efficient manner.

- Several government initiatives have been supporting the development of programmes and tools to encourage AA and substitution;
- ….. also academics (e.g. the Lowell Center for Sustainable Production); NGOs, and industry.

Guidance is being developed…

- Frameworks for AA: arrangement of analyses and decisions that can be used to assess alternatives;

- Tools for AA: approaches for evaluating a chemical, material, process, product, and/or technology for the purpose of attribute analysis within an alternatives assessment;

- And others (e.g. Principles, etc.)

See an OECD meta review of existing tools and frameworks at:

http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2013)24&doclanguage=en

What could help

- Gather existing tools, frameworks and resources existing to support AA in a one place repository;

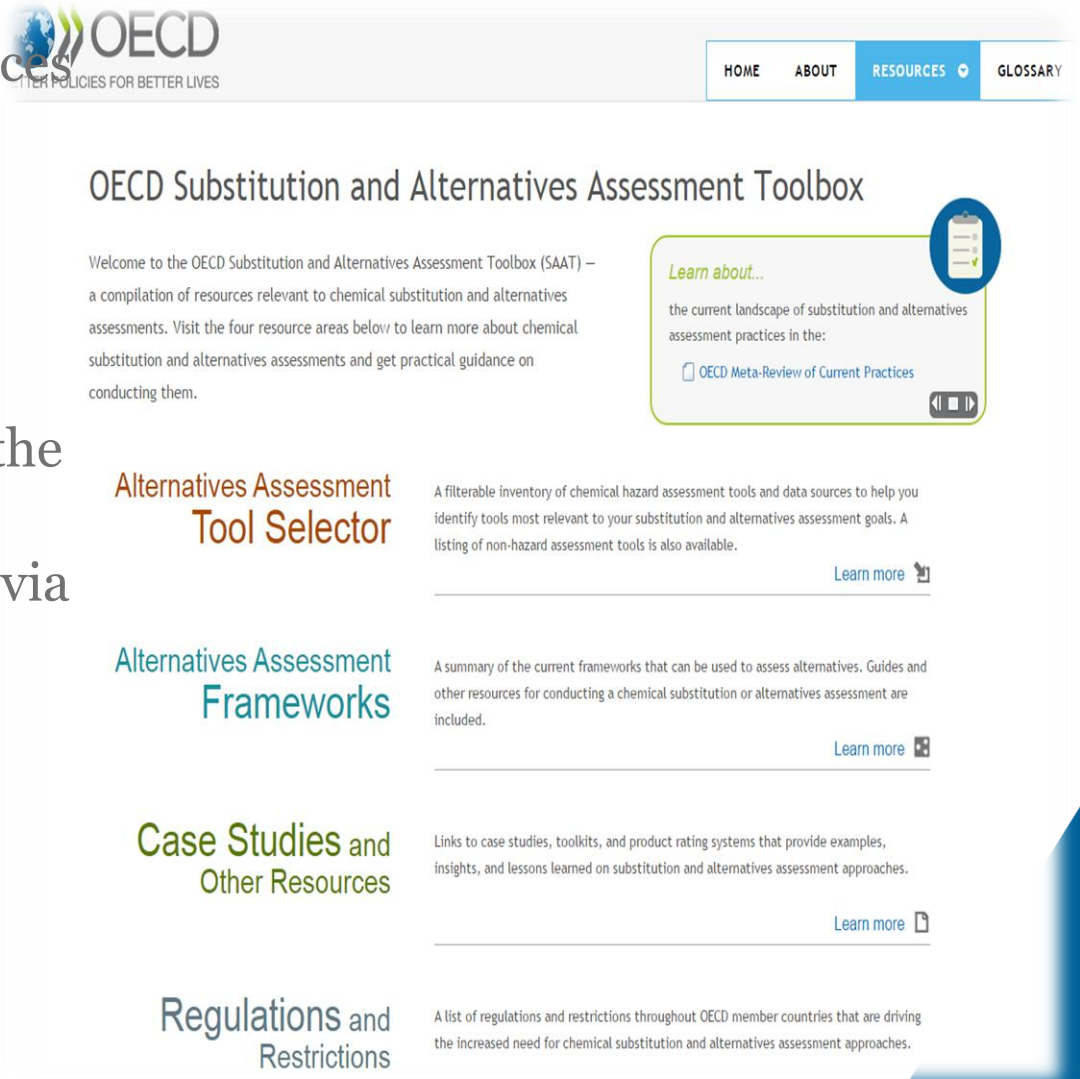
- Collect case studies from actual substitution.

OECD Subsitution and Alternatives Assessment Toolbox (SAAToolbox)
www.oecdsaatoolbox.org

THE SAATOOLBOX

OECD Substitution and Alternatives Assessment Toolbox (SAAToolbox)

- Brings together practical resources on chemical substitution and alternatives assessments
- Development by a collaborative effort
  - Content development led by technical workgroup under the Ad Hoc Group
  - Test versions demonstrated via several webinars; feedback incorporated
- Launched in January 2015 @ **www.oecdsaatoolbox.org**
- Updated on an ongoing basis



OECD Substitution and Alternatives Assessment Toolbox

Welcome to the OECD Substitution and Alternatives Assessment Toolbox (SAAT) — a compilation of resources relevant to chemical substitution and alternatives assessments. Visit the four resource areas below to learn more about chemical substitution and alternatives assessments and get practical guidance on conducting them.

Learn about...

the current landscape of substitution and alternatives assessment practices in the:

OECD Meta-Review of Current Practices

Alternatives Assessment Tool Selector

A filterable inventory of chemical hazard assessment tools and data sources to help you identify tools most relevant to your substitution and alternatives assessment goals. A listing of non-hazard assessment tools is also available.

Learn more

Alternatives Assessment Frameworks

A summary of the current frameworks that can be used to assess alternatives. Guides and other resources for conducting a chemical substitution or alternatives assessment are included.

Learn more

Case Studies and Other Resources

Links to case studies, toolkits, and product rating systems that provide examples, insights, and lessons learned on substitution and alternatives assessment approaches.

Learn more

Regulations and Restrictions

A list of regulations and restrictions throughout OECD member countries that are driving the increased need for chemical substitution and alternatives assessment approaches.

Learn more

OECD Substitution and Alternatives Assessment Tool Selector

For details on how the tools were identified and scored for the Tool Selector, please visit the Tool Selector Methodology page.

The Tool Selector is designed to provide information on online resources and software that can be used in conducting chemical substitutions or alternatives assessments. The Tool Selector is divided into two categories: tools, which provide users with the ability to evaluate a chemical, material, process, product and/or technology for attribute analysis with an alternatives assessment, and data sources, which contain a repository of organized information but no mechanism for data manipulation for outside users.

The filters below may be used to identify tools and data sources of greatest relevance to your substitution or alternatives assessment goals – see the first tab for tools, and the second tab for data sources. You may also view more in-depth information on each tool and data source, or a side-by-side comparison of a set of tools or data sources, by selecting two or more items from the list below.

All tools and data sources included in the Tool Selector address chemical hazard assessment, and may address other comparative attributes. 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 and data source has its benefits and limitations. The user of this toolbox needs to understand the capabilities of the tools and data sources to make the most informed decisions about conducting alternatives assessments.

Tools | Data Sources

Filter Options (- Hide)

Applicability:

- [ ] Chemical substitution
- [ ] Material substitution
- [ ] Product substitution
- [ ] Process modification

Chemical Hazard Attributes:

- [ ] Human health
- [ ] Ecotoxicity
- [ ] Environmental fate
- [ ] Chemical/physical properties

User Friendliness:

- [ ] Automated
- [ ] Available in multiple languages
- [ ] Guidance available
- [ ] Support/training available

Fees to use tool:

No preference

Tool Capabilities:

- [ ] Identifies chemical characteristics
- [ ] Compares alternatives
- [ ] Prioritizes substances for assessment
- [ ] Identifies examples and/or case studies

Other Comparative Attributes:

- [ ] Cost/benefits and availability
- [ ] Exposure
- [ ] Life-cycle impacts
- [ ] Materials management
- [ ] Social impacts
- [ ] Technical feasibility

User Expertise:

Expertise needed to use tool:

No preference

Expertise needed to interpret results:

No preference

Filter

Tools | Data Sources

Filter Options (- Hide)

Human Health Effects:

- [ ] Acute mammalian effects
- [ ] Chronic mammalian effects
- [ ] Sensitization and irritation

Environmental Toxicity and Fate:

- [ ] Ecotoxicity
- [ ] Environmental fate

Type of Source:

- [ ] Single data source
- [ ] Compendium

Physical and Chemical Properties:

- [ ] Chemical structure
- [ ] Vapor pressure
- [ ] Water solubility
- [ ] Log KOW
- [ ] Other

Safety Information:

- [ ] Exposure limits
- [ ] First aid
- [ ] Personal protective equipment

Comparative Attributes:

- [ ] Cost/benefits and availability
- [ ] Exposure
- [ ] Life-cycle impacts
- [ ] Materials management
- [ ] Technical feasibility

User Friendliness:

- [ ] Available in multiple languages
- [ ] Guidance available
- [ ] Support/training available

Fees to use tool:

No preference

Filter

List of Tools

A color-coded summary score is shown below for each tool. Scoring by specific filter categories is also available.

Tools match 80% 50-80% 50% of filter criteria

View Scores by Category

Compare

Sorted by: Most relevant, based on above filters

Compare 88% swerea|IVF

ChemicALL (Summary | Tool Website) DS

Chemicall is a database of hazardous chemicals used by members of the Swedish Chemicals Group in the electronics and textile industries. All chemicals contained in the database have been identified as hazardous per authoritative sources. Chemicall also identifies human health and environmental impacts, as well as authoritative "chemicals of concern" lists that contain a specific chemical.

Compare 81% IFA Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung

Column Model (Summary | Tool Website)

The Column Model was developed by the Institute for Occupational Safety and Health (IFA) of the German Social Accident Insurance as a tool for industry for identifying alternative substances. The tool allows for the comparison on chemicals/substances or materials/mixtures based on six hazard endpoints. Endpoints are compared individually and collectively, and the user makes the final evaluation.

Compare 81% KEMI Swedish Chemicals Agency

Kemi PRIO (Summary | Tool Website)

PRIO was developed by the Swedish Chemical Inspectorate (Kemi) to help eliminate high hazard chemicals from products to meet the Swedish government's goal of a "non-toxic environment" by 2020. PRIO contains a database of chemicals of high concern to human health and the environment, which are divided into "phase-out" or "priority risk reduction" chemicals. “Phase-out” chemicals should be avoided or substituted, and the tool provides a seven step process for identifying safer alternatives. For “priority risk reduction” chemicals, further assessments are recommended to ensure risk minimization.

Compare 75% eChemPortal

eChemPortal (Summary | Tool Website) DS

A searchable database for obtaining many properties of chemicals: physiochemical properties, toxicity, ecotoxicity, and environmental fate/pathways. The first tier of results provides references to external data. The user must access these external sources for data.

Compare 75% GREEN SCREEN FOR SAFER CHEMICALS

GreenScreen® for Safer Chemicals (Summary | Tool Website)

GreenScreen® was developed by Clean Production Action to support the transition to safer chemicals and to support more informed decision-making on the use of chemicals in products and processes. GreenScreen® provides a rigorous comparative hazard assessment for evaluating alternatives to chemicals of concern based upon 18 hazard endpoints.

Comparison of Selected Alternatives Assessment Tools

Displayed below are the tools selected for comparison from the previous page. An in-depth description of tool hazard endpoints, applicability, user expertise, and other tool-specific traits is provided for each tool. For tools you no longer wish to compare on this page, please click to "X" button located by the tool's name.

	Pollution Prevention Options Analysis System (P2OASys)	RISCTOX	CleanGredients®
Summary	P2OASys was developed by the Toxic Use Reduction Institute (TURI) at the University of Massachussetts, Lowell to help companies assess unforeseen consequences of current alternative technologies. P2OAsys allows companies to assess environmental, worker, and public health impacts from alternative technologies. The tool automatically compares current processes to alternatives based on 11 endpoints using an aggregated score, which is dependent upon the proportion of chemical present.	RISCTOX was developed by the Spanish Trade Union Institute of Health, Work and Environment (ISTAS) and the European Trade Union Institute (ETUI) and is based on European environmental and health standards. The tool includes over 100,000 chemicals, providing information on substance classification and labeling under ECHA Regulation 1272, health and environmental impacts and risks, and environmental and health regulations. Users can search by hazard endpoint or specific substance.	CleanGredients® was developed by GreenBlue® to help cleaning product formulators identify environmentally friendly ingredients and allow manufacturers to showcase their ingredients. CleanGredients® is a subscription-based online database with 12 cleaning product ingredient categories: chelating agents, colorants, defoamers, enzymes, fragrances, oxidants, polymers, preservatives and antioxidants, processing aids, solvents, starter formulations, and surfactants. Non-subscribers have partial access to website information. Ingredient formulation and attribute claims are verified by an approved third-party.
Tool Developer	Toxic Use Reduction Institute (TURI), University of Massachusetts Lowell	Spanish Trade Union Institute of Health, Work and Environment (ISTAS), and European Trade Union Institute (ETUI)	GreenBlue®
Designed for	Industry	Companies interested in workplace safety	Cleaning product formulators and manufacturers
Tool Capabilities	• Identifies intrinsic characteristics such as known human health hazards associated with a chemical • Prioritizes substances for alternatives assessment based on attributes of interest • Identifies completed alternatives assessments, case studies, and examples of successful substitutions	• Identifies intrinsic characteristics such as known human health hazards associated with a chemical	• Identifies intrinsic characteristics such as known human health hazards associated with a chemical

Case Studies | Toolkits | Product Rating Systems

Case studies are descriptions of alternatives assessments that have been conducted by manufacturers, academic institutions, NGOs or government bodies. The search feature below may be used to identify case studies of greatest relevance to your substitution or alternatives assessment goals. You may also view more in-depth information on each case study by clicking the "View Full Summary" button. For details on how case studies were selected and summarized, please visit the Case Studies Methodology page.

Additional compilations of completed alternatives assessments include (but are not limited to) the following resources:

- The SUBSPORT web portal, a compilation of case studies to support companies in fulfilling substitution requirements within EU legislation.
- The Interstate Chemical Clearinghouse (IC2) Alternatives Assessment Library.
- ECHA's repositories of 'analysis of alternatives' performed in the context of REACH applications for authorisation, and in the context of REACH restriction proposals.

Search by one or more fields:

CAS Number: e.g., 7550-45-0

Chemical: e.g., lead; mercury

Author: e.g., U.S. EPA; BizNGO

Industry Sector: e.g., electronics

Technical Function: e.g., solvent; catalyst

Attributes: All attributes assessed

Framework: All frameworks

Search

Number of case studies shown: 32 of 32 (Show All)

Number of case studies shown: 31 of 32 (Show All)

Alteration of Manufacturing Processes to Reduce Exposure to Titanium Tetrachloride

No date | Titanium tetrachloride (7550-45-0) and more... | Hybrid car batteries

View Full Summary

American Industrial Hygiene Association

A company that makes a proprietary product used in the manufacturing of hybrid car batteries redesigned its production process to eliminate the use of titanium tetrachloride as a catalyst and remove seven manual handling operations. These steps helped reduce operator and community exposures to the...

✔ Chemical Hazard ✔ Exposure ✔ Technical Feasibility ✔ Cost/Benefits & Availability

Alternatives to Methylene Chloride in Paint and Varnish Strippers: Availability of Safer Alternatives & Requirements for Meeting Stage 1 of the California Safer Consumer Products Regulations

2015 | Methylene chloride (DCM) (75-09-2) and more... | Paint/varnish strippers

View Full Summary

BizNGO

This analysis models the perspective of a manufacturer of a methylene chloride-based paint stripper for consumers that seeks compliance with the California Safer Consumer Products regulations. The category of paint strippers that is the subject of this alternatives analysis includes both consumer...

✔ Chemical Hazard ✔ Exposure

Frameworks and Guides

As defined in the OECD Meta-Review, a chemical substitution or alternatives assessment framework is an arrangement of analyses and decisions that can be used to assess alternatives. A number of organizations have developed frameworks and guides in response to regulations of chemical substances and stakeholder interest in having consistent approaches to evaluate alternatives. Frameworks differ in terms of the attributes addressed and the methodologies used.

Learn about...

the commonalities and differences between different chemical substitution and alternatives assessment frameworks.

Show 10 entries Search:

Organization Type	Organization Name	Content	Description
Academia	Toxics Use Reduction Institute (TURI)	Alternatives Assessment Guidance	Appendix A. Alternatives Assessment Process Guidance is the result of a 2006 study by TURI to assess the suitability of alternatives to five common hazardous chemicals using a novel framework. The guide focuses on economic feasibility and does not provide measure for the relative safety of alternatives.
Academia	University of California, Los Angeles (UCLA) Sustainability Technology & Policy Program	Developing Regulatory Alternatives Analysis Methodologies for the California Green Chemistry Initiative	Developing Regulatory Alternatives Analysis Methodologies for the California Green Chemistry Initiative is a report developed under UCLA's Sustainable Technology & Policy Program to assist in alternatives analysis as required by the California Green Chemistry Initiative (AB 1879). Utilizing multi-criteria decision analysis (MCDA) as an assessment aid, the report explains the application of this methodology to the assessment of chemical alternative case studies for two popular industrial uses: garment cleaning and lead solder in electronics.
Government	European Chemicals Agency (ECHA)	Guidance on the preparation of an application for authorisation	The Guidance on the Preparation of an Application for Authorization document is intended to assist Stakeholders in the preparation of documents when sponsoring novel chemicals for authorization in the EU. While this guide cannot be considered a complete interpretation of legal obligations under REACH legislation, it is part of a series of guides intended to simplify compliance and should be considered a component of a complete alternatives assessment.

Regulations and Restrictions

This resource provides a table of restricted substances lists and related laws and regulations organized by **geographic scope**. The linked substances lists provide descriptions of substances/chemicals that are legally or voluntarily restricted or recommended for restriction due to their hazards or have been examined by jurisdictions based on potential concerns of a similar nature.

International Scope

Use the "Geographic Scope" identifier to find regulations and restrictions most relevant to your area.

Regulations and restrictions information is currently available for Australia, Canada, China, Hong Kong, the European Union, Japan, New Zealand, Singapore, South Korea, Sweden, the United States of America, and for international regulations.

Country	Governing Body	List of Hazardous Substances	Legislation
Australia	Government	Prohibited or Restricted Cosmetic Chemicals in Australia	Industrial Chemicals (Notification and Assessment) Act 1989
Canada	Government	First Priority Substance List designated by Section 11 of CEPA 1988	Canadian Environmental Protection Act (CEPA), 1999
		Second Priority Substance List designated by Section 11 of CEPA 1988	
		A complete list of substances recognized by Canada's Chemical Challenge Program	
		The Virtual Elimination List as designated by Section 65 of CEPA	
		Toxic Substances List - Schedule 1	
		Comprehensive Listing of Substances that are Subject to a Significant New Activity Notices	
		Cosmetic Ingredient Hotlist: Prohibited and Restricted Ingredients	Food and Drugs Act
China	Government	Announcement on the List of Toxic Chemicals Severely Restricted on the Import and Export in China (Circular No. 65 [2005])	
		Directions for the Registrations of Environmental Management on Import and Export of Toxic Chemicals	
		Amendment on the List of Toxic Chemicals Severely Restricted on Import and Export in China (Circular No. 80 [2006])	
		Announcement on the Catalogue of Commodities Prohibited from Import (The 6th Batch) and the Catalogue of Commodities Prohibited from Export (The 3rd Batch) (Circular No. 116 [2005])	
		Restricted substances under Schedule I of the Hazardous Chemicals Control Ordinance	Hazardous Chemicals Control Ordinance

Maintaining and updating the toolbox

- Adding new alternatives assessment tools and data sources within the Toolselector;
- Adding new case studies;
- Updating other sections in the toolbox;
- Awareness raising activities.

You can send comments on the toolbox at:
ehscont@oecd.org

Work Underway

- Cross Country Analysis of Approaches to Substitution and Alternatives Assessments;

- Workshop, 2-3 May 2018, Paris

  to exchange experiences on policy, regulatory and other approaches used to support alternatives assessment and the substitution.

SUPPORTING A GLOBAL TRANSITION TOWARD SAFER ALTERNATIVES TO PFASS

The OECD/UNEP Global PFC Group

- Group established in 2012 **to facilitate the exchange of information on PFASs and to support a global transition towards safer alternatives**;

- Supported jointly by OECD and UNEP, it operates under a mandate of the International Conference on Chemicals Management (ICCM):
  - *ICCM 2 (2009) Resolution II/5, calling upon intergovernmental organisations, governments and other stakeholders to "consider the development, facilitation and promotion in an open, transparent and inclusive manner of national and international stewardship programmes and regulatory approaches to reduce emissions and the content of relevant perfluorinated chemicals of concern in products and to work toward global elimination, where appropriate and technically feasible".*

- It brings together experts from OECD member and non-member countries in academia, governments, industry and NGOs, representatives from other international organisations.

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Follow us

Portal on Per and Poly Fluorinated Chemicals

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- Websites:
  - http://www.oecd.org/chemicalsafety/risk-management/
  - http://www.oecdsaatoolbox.org/