

# Lessons Learned from Third-Party Approaches that Support Substitution of Chemicals of Concern



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# About the OECD

The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental organisation in which representatives of 38 industrialised countries in North and South America, Europe and the Asia and Pacific region, as well as the European Commission, meet to co-ordinate and harmonise policies, discuss issues of mutual concern, and work together to respond to international problems. Most of the OECD's work is carried out by more than 200 specialised committees and working groups composed of member country delegates. Observers from several countries with special status at the OECD, and from interested international organisations, attend many of the OECD's workshops and other meetings. Committees and working groups are served by the OECD Secretariat, located in Paris, France, which is organised into directorates and divisions.

The Environment, Health and Safety Division publishes free-of-charge documents in twelve different series: **Testing and Assessment; Good Laboratory Practice and Compliance Monitoring; Pesticides; Biocides; Risk Management; Harmonisation of Regulatory Oversight in Biotechnology; Safety of Novel Foods and Feeds; Chemical Accidents; Pollutant Release and Transfer Registers; Emission Scenario Documents; Safety of Manufactured Nanomaterials;** and **Adverse Outcome Pathways**. More information about the Environment, Health and Safety Programme and EHS publications is available on the OECD's World Wide Web site ([www.oecd.org/chemicalsafety/](http://www.oecd.org/chemicalsafety/)).

*This publication was developed in the IOMC context. The contents do not necessarily reflect the views or stated policies of individual IOMC Participating Organizations.*

The Inter-Organisation Programme for the Sound Management of Chemicals (IOMC) was established in 1995 following recommendations made by the 1992 UN Conference on Environment and Development to strengthen co-operation and increase international co-ordination in the field of chemical safety. The Participating Organisations are FAO, ILO, UNDP, UNEP, UNIDO, UNITAR, WHO, World Bank and OECD. The purpose of the IOMC is to promote co-ordination of the policies and activities pursued by the Participating Organisations, jointly or separately, to achieve the sound management of chemicals in relation to human health and the environment.

# IOMC

INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS

A cooperative agreement among FAO, ILO, UNDP, UNEP, UNIDO, UNITAR, WHO, World Bank and OECD

# Foreword

This report was developed as background to the OECD Workshop on Government Approaches to Incentivise Substitution that took place in Paris on 20-21 September 2022 under the auspices of the OECD Working Party on Risk Management (WPRM). The drafting of this report as well as the organisation of the workshop was made possible thanks to a voluntary contribution from Australia.

The report provides information on the current landscape of third-party approaches to chemical substitution across OECD member countries, and in doing so, provides information on those approaches that can be used by governments and other stakeholders to inform their chemical risk management efforts. For the purposes of this report, third-party organisations are considered to be those that are neither the regulator (e.g., government entities) nor those that are directly regulated with regard to chemical risk management (e.g., chemical or product manufacturers). This work responds to an ever-increasing focus on informed substitution and alternatives assessment brought about by government policies, market and supply chain factors, and consumer and worker concerns.

The report was prepared by Emily Connor and Claire Hacker from Abt Associates with input from the workshop participants, the OECD Secretariat, as well as members of the WPRM. It is published under the responsibility of the OECD Chemicals and Biotechnology Committee.

# Executive Summary

The goal of this report is to characterize the current landscape of third-party (not government or regulated industry) approaches to chemical substitution across OECD countries, and in doing so, to provide information on those approaches that can be used by governments and other stakeholders to inform their chemical risk management efforts. This work responds to an ever-increasing focus on informed substitution and alternatives assessment brought about by government policies, market and supply chain factors, and consumer and worker concerns.

In this report, a set of 33 approaches have been selected to represent the breadth and diversity of third-party approaches from across OECD member countries. In Chapter 3, the approaches are divided into six groupings to facilitate comprehension of this diverse landscape:

- Tools, Methods, and Other Technical Resources;
- Technical Assistance and Training;
- Ecolabels;
- Advocacy and Awareness-Raising;
- Education and Professional Associations; and
- Retailer Strategies.

Each grouping includes an overview and brief analysis of approaches within the grouping as well as descriptions of specific approaches. In Chapter 4, a synthesis is presented of lessons learned, common themes, and opportunities for governments. Chapter 4 emphasizes the diversity of third-party approaches in terms of tactics, audiences, and scope, and it identifies features that are common to many of the approaches. The report concludes with a brief assessment of ways that governments can adopt or support elements of third-party approaches.

# Table of contents

<b>Foreword</b> .....	<b>3</b>
<b>Executive Summary</b> .....	<b>4</b>
<b>1 Background</b> .....	<b>6</b>
<b>2 Methodology</b> .....	<b>8</b>
<b>3 Summary of Third Party Approaches</b> .....	<b>9</b>
3.1. Tools, Methods, and Other Technical Resources .....	9
3.2. Technical Assistance and Training .....	13
3.3. Ecolabels .....	16
3.4. Advocacy and Awareness Raising .....	19
3.5. Education and Professional Associations .....	22
3.6. Retailer Strategies.....	25
<b>4 Synthesis of Lessons Learned</b> .....	<b>28</b>
<b>References</b> .....	<b>30</b>

# 1 Background

Throughout OECD countries, the increased demand for safer chemicals, technologies, and products has advanced the development and use of informed substitution and alternatives assessment approaches. Informed substitution can be defined as “replacing hazardous substances with safer alternatives [and] is the goal of a solutions-oriented approach to chemical management” (U.S. Occupational Safety and Health Administration [OSHA], n.d.). Whereas informed substitution is the considered act of replacing a hazardous chemical, article, or process with a safer alternative, alternatives assessment is the stepwise process by which potential alternatives are evaluated.

Key drivers of informed substitution and alternative assessments include government policies (both regulatory and non-regulatory), market and supply chain factors, and heightened calls from advocacy organizations, workers, and consumers to eliminate chemicals of concern in a wide array of products. Government regulations related to chemical risk management include the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) regulation in the European Union (EU) and state-level regulations in the United States (U.S.). Against this backdrop, there are many different stakeholders who use—or who are working to advance the practice of—informed substitution and alternatives assessment approaches, including government programs, chemical and product manufacturers, and third-party organizations.

This report is focused on tools and approaches developed and implemented by third-party organizations that support substitution of chemicals of concern in products, articles, and processes. For the purposes of this report, third-party organizations are considered to be those that are neither the regulator (e.g., government entities) nor those that are directly regulated with regard to chemical risk management (e.g., chemical or product manufacturers). As such, third-party organizations described in this report may include non-profit organizations, academic institutions, and retailers, among others. The report aims to:

- Characterize the current state-of-practice of third-party approaches to chemical substitution across OECD countries;
- Facilitate comparison and understanding of third-party approaches across different countries and regulatory contexts; and
- Summarize lessons learned from the identified approaches that could be adopted or supported by governments.

The goal of this report is to provide information on third-party approaches that can be used by government programs to inform the development or enhancement of their chemical risk management strategies. Additionally, the report can be used by other stakeholders - including regulated industry and other third-party organizations - to better understand the current landscape of third-party approaches and/or to identify opportunities for advancing the field.

The report updates and builds upon previous OECD efforts that have identified third-party approaches, including the report “Current landscape of alternatives assessment practice: A meta-review” (OECD, 2013) and the OECD Substitution and Alternatives Toolbox or SAAToolbox (OECD, n.d.). It does not capture government programs (whether regulatory or voluntary in nature) nor initiatives led by regulated industry,



which were characterized by other reports and presentations as part of the Fall 2022 OECD Workshop titled “Government Approaches to Incentivise Substitution of Chemicals of Concern in Products, Articles, and Processes”.

# 2 Methodology

This report summarizes current approaches developed and implemented by third-party organizations across OECD member countries to support the substitution of chemicals of concern. Approaches were identified through existing repositories (e.g., the OECD SAAToolbox; OECD, n.d.), literature searches, web searches, and input from members of the OECD Working Party on Risk Management (WPRM).

When selecting third-party approaches to include in this report, factors that were considered included the overall purpose of the approach, the intended audience(s), availability of information, and the geographic location of the implementing organization. Approaches were selected with the goal of representing geographic diversity across OECD member countries. (The country affiliations listed throughout the report are based on the headquarters location of the implementing organization for each approach.) The goal of the report is to characterize the breadth and diversity of third-party approaches from across OECD member countries, not to be exhaustive.

The report summarizes 33 approaches, which are divided into six groupings. A given approach is not intended to capture all activities carried out by the implementing organization or company—rather, it is a specific realm of activity carried out by the organization—and as a result, approaches within this report are grouped by activity type rather than by organization type. The groupings used in this report are as follows:

- Tools, Methods, and Other Technical Resources (Chapter 3.1),
- Technical Assistance and Training (Chapter 3.2),
- Ecolabels (Chapter 3.3),
- Advocacy and Awareness-Raising (Chapter 3.4),
- Education and Professional Associations (Chapter 3.5), and
- Retailer Strategies (Chapter 3.6).

Each grouping contains an overview and brief analysis comparing the approaches; short summaries of approaches with links to additional information; and a longer “spotlight” of one approach. The short summaries and spotlights were prepared using publicly available information, largely from the implementing organizations’ websites. In addition, each spotlight was provided to the implementing organization for review and was revised based on any input or additional information provided.

Chapter 4 provides a holistic view of the approaches and groupings included in the report and synthesizes lessons learned, common themes, and opportunities for governments to adopt or support elements of the third-party approaches.

# 3 Summary of Third Party Approaches

## 3.1. Tools, Methods, and Other Technical Resources

The approaches covered within this grouping include tools, data sources, frameworks, and guides, and they demonstrate the diversity of technical resources that third-party organizations have developed and made available. While some require payment, these are all resources that practitioners can access on their own schedule to inform and facilitate their chemical substitution work.

While these approaches all facilitate informed substitution, they are relevant to different stages in the chemical substitution process. They may provide steps or guidance to help practitioners conduct alternatives assessments; provide resources for identifying chemicals of concern and/or safer alternatives; or promote innovation and development of new alternatives. For example, a tool like SciveraLENS® or the SIN List may help a company identify chemicals of concern in their manufacturing processes that should be prioritized for substitution, while bluesign® FINDER or the Circular Design Guide may help them explore alternatives. Frameworks such as A Framework to Guide Selection of Chemical Alternatives are unique in that they provide guidance on steps for conducting an alternatives assessment and require significant data inputs from the practitioner, as opposed to data sources and databases (e.g., Chemicalize) that can be used as sources of chemical information. It is also worth noting that several of these resources go beyond intrinsic hazard to also include sustainability and lifecycle considerations.

Although these approaches were all developed by third-party organizations, several of them build in some way upon approaches developed by governments. For example, the GreenScreen® method for comparative hazard assessment was developed using a U.S. Environmental Protection Agency (EPA) alternatives assessment method as a starting point. As another example, the SIN List relies on criteria defined within REACH to identify chemicals of concern that should be prioritized for substitution, whether or not they have been regulated under REACH to date.

### 3.1.1. A Framework to Guide Selection of Chemical Alternatives

National Academies of Sciences, Engineering, and Medicine  
*United States*

A Framework to Guide Selection of Chemical Alternatives (2014) outlines a 13-step alternatives assessment framework, ranging from identification of a chemical of concern to alternative implementation and pathways for innovation. In addition to hazard assessments, the framework incorporates steps for lifecycle thinking (e.g., impacts of a chemical from production to disposal) and for performance and economic assessments. The framework was informed by previous efforts from regulatory agencies, academic institutions, and others and was intended to address components not sufficiently addressed by those efforts. The framework is publicly available for no charge.

<https://nap.nationalacademies.org/catalog/18872/a-framework-to-guide-selection-of-chemical-alternatives>

### 3.1.2. bluesign® FINDER

Bluesign Technologies AG  
*Switzerland*

Bluesign is a company offering a variety of services and tools, including an ecolabel for textiles and services to support companies in producing safer textile products. They also offer bluesign® FINDER, a web-based search engine allowing users to access a positive chemical products list that can help identify safer alternatives for use in textile manufacturing. The search engine contains bluesign® APPROVED chemical products—meeting Bluesign’s criteria for human and environmental hazard and exposure across the lifecycle—plus information needed to implement those products. The tool is intended for manufacturers and is freely available.

<https://www.bluesign.com/en/finder>

### 3.1.3. Chemicalize

Chemaxon  
*Hungary*

Chemicalize is a web-based tool for chemical property prediction, searching, and drawing. The tool provides structure-based property prediction for a range of properties (e.g., solubility, molecular mass, pKa, polarizability) based on a drawn structure or chemical identifier. Additionally, Chemicalize allows name or structure-based chemical searching through patents and academic literature, as well as creation of two- and three-dimensional publication-ready visualizations. Chemicalize is a paid tool and offers plans for institutions, academics, businesses, and individuals.

<https://chemicalize.com/welcome>

### 3.1.4. The Circular Design Guide

Ellen McArthur Foundation and IDEO  
*United Kingdom, United States*

The Circular Design Guide is a website providing methods and resources focused on a “radical, restorative, regenerative approach to business” and enabling implementation of the circular economy. The Guide includes several methods and activities to enable safer chemical selection and use, including activities on material selection, mapping the impacts of material selection, and product redesign. The Guide provides content for all levels of experience and is generally geared towards designers and innovators. The activities, workshop guides, and worksheets are free to download and use.

<https://www.circulardesignguide.com/>

### 3.1.5. MaterialWise

ChemForward  
*United States*

MaterialWise is a web-based tool enabling users to avoid problematic substances in their products, particularly focused on impacting the design process. The screening tool allows users to upload their product formulations and check chemicals against consolidated “global regulatory and authoritative lists,” which flag both human and environmental health hazards, to identify chemicals of concern. Additionally,

MaterialWise allows users to screen their chemistries for compliance with the RSLs of various preferred purchasing and certification programs. The tool is free to use.

<https://www.materialwise.org/>

### **3.1.6. SciveraLENS®**

Enhesa

*United States*

SciveraLENS® is a software platform for product assessment built on a library of more than 4,000 chemical hazard assessments across 23 endpoints. This tool aids users in identifying chemicals of concern within a company's supply chain and subsequently obtaining safer alternatives. Scivera emphasizes simplified and integrated data management across data gathering, screening, and assessment through a user-friendly interface. SciveraLENS® is a paid tool, used by large companies like Nike, Costco, and Intel, as well as supporting several ecolabels (such as the Global Electronics Council's EPEAT ecolabel).

<https://www.scivera.com/sciveralens/>

### **3.1.7. SIN List**

ChemSec

*Sweden*

The SIN (Substitute It Now) List is an online list of about 1,000 chemicals that ChemSec has identified as Substances of Very High Concern (SVHCs) according to the criteria defined within REACH to support chemical substitution. For each chemical, the SIN List provides additional information such as REACH status, use and function, and alternatives. The list is freely available to the public but is intended for a technical audience. Users of the SIN List include industry, retailers, governments, investors, researchers, and NGOs.

<https://sinlist.chemsec.org/what-is-the-sin-list/>

## GreenScreen® for Safer Chemicals



GREENSCREEN  
FOR SAFER CHEMICALS

*Clean Production Action*

*United States*

<https://www.greenscreenchemicals.org/>

**Overview:** GreenScreen® for Safer Chemicals is a method for comparative hazard assessment that supports informed substitutions of chemicals and substances. It has undergone continuous improvement and expert peer review since its publication in 2007. It builds upon the U.S. EPA's Design for the Environment (DfE) alternatives assessment method, which summarizes data on a chemical's inherent hazard—human health effects, environmental fate, and aquatic toxicity—into a matrix of hazard endpoints ranked as high, moderate, or low. While Clean Production Action offers a variety of services, including GreenScreen Certified™, which is a product-level certification, its two main tools are GreenScreen® for Safer Chemicals assessments and the GreenScreen List Translator™.

**Intended audiences:** Nonprofit organizations, government, industry, academia, other alternatives assessment practitioners.

**How the approach works:** GreenScreen® methods consolidate hazard information across 18 human health, environmental, and physical endpoints into a single score that facilitates comparison and communication of chemical hazard. In the GreenScreen® assessment method, practitioners first gather data from sources including measured data, scientific literature, authoritative lists, and models. Practitioners use this data and their expertise to analyze the chemical's adverse effects and determine a hazard level ranging from very high to very low for each endpoint (or note a data gap). As part of this process, GreenScreen® also considers environmental transformation products. From the resulting hazard summary table, GreenScreen® assigns a Benchmark score, indicating a chemical's "location" along a progression of high concern to safer chemicals (or an unspecified score due to insufficient data). These high-level indicators, supported by summary tables and additional reports, allow informed decision making in chemical use and substitution.

Separate from the GreenScreen® assessment method, the GreenScreen List Translator™ is a rapid screening method that aggregates over 40 authoritative hazard lists to help users identify chemicals of significant concern, which can aid in prioritizing chemicals for replacement.

**Required expertise and resources:** Guidance and resources for conducting GreenScreen® assessments are freely available to the public but require technical expertise to implement. The organization offers webinars as well as advanced trainings that enable participants to become a Licensed GreenScreen Profiler (a firm offering assessment services to clients) profiler or an Authorized GreenScreen Practitioner (an individual offering assessments internally for their organization). Clean Production Action offers the Green Screen® Assessment Registry, which provides access to completed assessments. Depending on the chemical, the completed assessments can be accessed for free or through purchase.

**Use and impacts:** GreenScreen® methods have been widely used and adopted. For example, several state regulatory agencies in the U.S. (e.g., Maine, Washington State, and California) use GreenScreen® to support policies pertaining to use of chemicals in consumer products. Businesses (e.g., Apple, Hewlett-Packard, and H&M) have used the methods to inform their chemicals management strategies. Additionally, GreenScreen® is featured in several alternatives assessment guides and frameworks (e.g., BizNGO's Chemical Alternatives Assessment Protocol and the Interstate Chemicals Clearinghouse's Alternatives Assessment Guide).

## 3.2. Technical Assistance and Training

The approaches covered in this grouping include technical assistance, training, and consulting services that practitioners and stakeholders can seek out to support their chemical substitution work. These approaches range from customized, person-to-person technical support to live or recorded trainings on chemical substitution principles and practices. While some require payment, asynchronous approaches such as GC3's training offerings and Yordas Insight's courses and webinars provide an avenue for practitioners and other stakeholders to gain knowledge and skills in alternatives assessment as well as related topics such as green chemistry and lifecycle considerations. Audiences for these trainings and courses may include retailers, manufacturers, non-governmental organizations, startups and innovators, students, and other interested stakeholders. More customized approaches such as Intersolia's consulting services and PPRC's technical assistance offerings provide practitioners with targeted, interactive support that can help them implement informed substitution in their day-to-day operations. Audiences for these approaches may include product and chemical manufacturers as well as commercial and industrial operations.

Trainings and technical assistance often leverage other third-party approaches, as well as government or regulated industry approaches. For example, PPRC offers technical assistance to companies seeking ecolabel certification. As another example, Yordas Insight's course offerings provide instruction on processes for chemical substitution within regulatory frameworks. As such, the approaches in this grouping amplify the impact of other approaches to expand both the number of practitioners and stakeholders engaged in the field and their depth of knowledge.

### 3.2.1. Green Chemistry and Chemical Stewardship Online Certificate Program

University of Washington Department of Environmental and Occupational Health Sciences  
Continuing Education Programs  
*United States*

The Green Chemistry and Chemical Stewardship Certificate Program provides online instruction in designing safer chemicals and industrial processes. The program covers topics such as incorporating hazard considerations into product design, and consists of three courses: Sustainability, Toxicology, and Human Health; Principles of Green Chemistry; and Assessment Tools for Safer Chemical Decisions. The program targets various audiences including scientists, product and supply chain stewardship professionals, graduate students, educators, and legal professionals, among others. The courses require paid registration and are intended for individuals with a four-year degree and basic chemistry knowledge.

<https://osha.washington.edu/pages/green-chemistry-chemical-stewardship-online-certificate-program>

### 3.2.2. Green Chemistry & Commerce Council (GC3) Safer Chemistry Training

Green Chemistry & Commerce Council  
*United States*

The GC3 is a multi-stakeholder collaboration driving the adoption of green chemistry across the economy through various research, outreach and advocacy programs. One of GC3's offerings is an online green chemistry curriculum consisting of recorded webinars (including one focused on chemical hazard assessment) and supplemental reading materials. The training provides basic and advanced content for audiences including businesses, purchasers, product formulators, and students. Each webinar indicates the background level of chemistry knowledge recommended for viewing that content. GC3 membership requires payment of annual dues, but the training is freely available.

<https://greenchemistryandcommerce.org/>

### **3.2.3. Intersolia**

Intersolia  
*United Kingdom*

Intersolia offers a variety of software for chemicals management, including options that provide access to chemical risk assessments and a guide for identifying chemical alternatives, as well as consulting services and trainings. Intersolia's consultants deliver professional guidance on chemical substitution, including support with determining criteria for alternatives and developing procedures for transitioning to alternatives. Intersolia also offers trainings on their software products as well as customized trainings to meet a company's specific chemical management needs. Use of Intersolia's tools and services requires payment.

<https://intersolia.com/>

### **3.2.4. Yordas Insight's Courses and Trainings**

Yordas Insight  
*United Kingdom*

Yordas Insight is a training solutions company that offers a course on sustainable chemicals management and several webinars relevant to chemical substitution. Its "Sustainable Chemicals Management: Substitution and Alternatives" e-learning course covers the principles of green chemistry, methods to compare sustainability tools (e.g., lifecycle assessment, cradle to cradle assessment), processes for substitution within a regulatory framework, and alternatives assessment. The course is paid. Yordas Insight also offers free webinars on topics including "Life Cycle Analysis to help inform Green Chemistry & Substitution" and "Sustainable Chemicals Management – utilizing Green Chemistry."

<https://www.yordasinsight.com/courses/Sustainable-Chemicals-Management-Substitution-and-Alternatives>



## Pollution Prevention Resource Center



*Pollution Prevention Resource Center*

*United States*

<https://pprc.org/>

**Overview:** The Pollution Prevention Resource Center (PPRC), based out of Washington State in the U.S., provides information and training to facilitate toxics reduction and pollution prevention for local governments and businesses. Founded in 1991 on the 21st anniversary of Earth Day, PPRC was established to “promote environmental protection through pollution prevention.”

Intended audiences: Governments, non-governmental organizations, businesses, and the manufacturing and commercial sectors.

**How the approach works:** PPRC’s mission is to provide direct training and technical assistance to businesses, governments (local, state, and tribal), and pollution prevention (P2) technical assistance providers through strategic partnerships and collaborations in the Pacific Northwest and nationally.

PPRC focuses on various topics related to chemical substitution. For example, PPRC has several projects and presentations that demonstrate viable substitutes for high-toxicity solvents used in industry. The organization provides a shortlist of less hazardous solvent active ingredients that might be effective in various cleaning applications. It also provides sector-specific substitution resources through a targeted report on substitutes for the cleaning solvent n-propyl bromide used in vapor degreasing as well as case studies on ultrasonic parts cleaning and less toxic auto repair degreasers. Past projects on safer alternatives included resources and reports on safer garment cleaning alternatives. Further supporting chemical substitution, PPRC provides certification assistance for businesses wishing to add substances to the U.S. EPA’s Safer Chemical Ingredients List (SCIL) and the CleanGredients database of chemical ingredients that meet the U.S. EPA’s Safer Choice Standard, and/or to obtain Safer Choice certification for formulated products. Eligible businesses receive up to 120 hours of technical assistance and \$5,000 towards assessment fees, which may enable companies to substitute hazardous chemicals in formulations with safer alternatives or to expand the realm of safer substitutes via submission to SCIL and CleanGredients.

**Required expertise and resources:** PPRC’s repository of presentations, reports, best practice manuals, and case studies on the use of less toxic chemicals, particularly solvents, is publicly available. The Safer Choice Certification Assistance program offers reimbursement to qualifying Oregon businesses. In addition to these longer-term efforts, PPRC also offers a free “rapid response service” to answer questions about P2 opportunities to inform decision making and reduce negative impacts from occupational exposure industrial pollutants.

**Use and impacts:** According to PPRC, their core contributions include catalyzing projects that bring people and resources together, identifying obstacles and opportunities via networking, and providing trusted information to decision makers to help them implement pollution prevention. As stated on PPRC’s website: “Because we are not regulators, we are considered trusted brokers of information and resources for businesses in the region, and this trust helps assure our success.”

### 3.3. Ecolabels

This grouping covers third-party certifications, standards and recognition programs that help consumers and institutional purchasers identify products and services that meet specific health and environmental criteria (and help manufacturers and other companies signal those traits to their customers). These ecolabels cover a wide variety of sectors, such as building materials, personal care products, apparel and textiles, information technology products, cleaning services, and buildings. The endpoints considered by each ecolabel are also diverse. The ecolabels described here each consider chemical hazard—whether by restricting specific hazardous substances, limiting volatile organic compound content, or encouraging movement toward safer chemistries—but many also incorporate additional lifecycle and sustainability considerations, such as water and energy use, climate impacts, and socially responsible manufacturing. In terms of both sectors and endpoints, these ecolabels have varying breadth of scope, with some ecolabels focusing on a small set of endpoints in a few sectors (e.g., eco-*INSTITUT*) and others assessing a wide variety of products and services against a larger set of endpoints (e.g., Cradle to Cradle Certified®). Ecolabels can also be differentiated by their sources of chemical data and requirements. For example, some ecolabels rely on authoritative lists (e.g., Cradle to Cradle Certified®) while others rely on more robust toxicological assessments (e.g., OEKO-TEX®).

What ecolabels have in common is their role in informing consumers and stimulating market demand for products with improved hazard profiles. Ecolabels not only provide consumers with information that allows them to choose safer and more sustainable products and services, but they also simplify business-to-business (institutional) purchasing (Golden et al., 2021). Ecolabels enable consumers and other purchasers to effect change throughout the supply chain, including product manufacturers as well as chemical suppliers, by allowing them to signal with their purchases that they want less hazardous products.

#### 3.3.1. *Cradle to Cradle Certified*®

Cradle to Cradle Products Innovation Institute Inc.  
*United States and the Netherlands*

Cradle to Cradle Certified® is a product standard focused on evaluating the safety, circularity, and responsible manufacture of goods such as apparel, building materials, and beauty products. The standard assesses products across five categories: material health (encompassing safer product chemistries), product circularity, climate protection and clean air, soil and water stewardship, and social fairness. Cradle to Cradle Certified® is used by manufacturers, retailers, designers, and brands to ensure their positive impact. Certification requires payment of fees to the institute and to an independent assessor, but the certified product registry is publicly available.

<https://www.c2ccertified.org/>

#### 3.3.2. *eco-*INSTITUT**

*eco-*INSTITUT** Germany GmbH  
*Germany*

The *eco-*INSTITUT** ecolabel can be earned by products such as furniture and construction materials that meet strict requirements for emissions and pollutants. Products are assessed based on their use category. Standards for a given product category may include requirements for exclusion of chemicals of high concern, responsible sourcing and biodegradability, product function, volatile organic compound content, and impurity analysis. The ecolabel is used by a variety of manufacturers and is targeted at architects,

builders, and health-conscious consumers. eco-INITIUT charges certification fees for testing and label use.

<https://www.eco-institut-label.de/en/>

### **3.3.3. Green Seal®**

Green Seal®  
*United States*

The Green Seal® ecolabel aims to identify safer and greener products and services. Green Seal® standards differ by product or service category, but they all aim to preserve the climate, protect human health, minimize waste, and ensure clean water. Standards may include environmental and human health criteria, chemical restrictions, volatile organic compound limits, and requirements for biodegradability, product performance, and water and energy use. Brands, cleaning services, and buildings use Green Seal® certification to signal environmental achievement to consumers. Companies seeking certification must pay Green Seal® for evaluation and a license.

<https://greenseal.org/>

### **3.3.4. TCO Certified**

TCO Development  
*Sweden*

TCO Certified is an ecolabel for information technology products. Assessment occurs across 11 product categories for criteria including socially and environmentally responsible manufacturing, product performance, material recovery, and hazardous substance use. TCO Certified generally restricts the use of hazardous substances like hexavalent chromium, certain halogenated molecules, and lead. GreenScreen® is used to inform the selection of safer chemical alternatives within the standard. The ecolabel is focused on the information technology industry and their consumers. TCO charges an annual and new certificate fee for certified products.

<https://tcocertified.com/>

OEKO-TEX®



OEKO-TEX Service GmbH

Switzerland

<https://www.oeko-tex.com/en/>

**Overview:** Founded in 1992, OEKO-TEX® is an association of 17 independent research institutes across Europe and Japan with the goal of enabling consumers and businesses in the textile and leather industry to “protect our planet by acting responsibly.” The association focuses on developing “limit values” (i.e., concentrations of chemicals of concern that are “safe from a human-ecological perspective”), test methods, and standards for the leather and textile industry. As of 2022, the organization maintains six standards and certifications.

**Intended audiences:** Brands, manufacturers, retailers, and traders in the textile and leather sector.

**How the approach works:** In the context of chemical substitution, the OEKO-TEX® standards indicate to consumers that appropriate chemical substitutions have been made to replace harmful substances in certified articles, and they signal to industry where new chemical substitutions must be made to achieve the ecolabel’s standards.

The flagship OEKO-TEX® STANDARD 100 label verifies that all components of an article have been tested for certain harmful substances (e.g., harmful plasticizers, pesticides, flame retardants, heavy metals, and carcinogenic dyes), implying the article does not have adverse human health impacts. Limit values for substances differ by product class, ranging from the most protective for articles for babies to the least protective for decoration materials. The OEKO-TEX® ECO PASSPORT certification system for chemicals, dyes, and auxiliary materials used in the textile and leather industry verifies every ingredient in those chemical products. Other OEKO-TEX® standards similarly verify the absence of listed harmful chemicals, and may also indicate other achievements (e.g., sustainable production conditions and lifecycle considerations). The organization’s standards account for both regulated (e.g., European Chemical Agency’s Substances of Very High Concern) and nonregulated substances. Their catalog of chemicals of concern and their limit values are updated at least annually and may be more stringent than governmental limits.

**Required expertise and resources:** Manufacturers, brands, or retailers may apply for an OEKO-TEX® certification with payment of license fees, though the various tests and audits are product- and standard-specific. The various OEKO-TEX® labels are verifiable and traceable through the OEKO-TEX® label check tool.

**Use and Impacts:** In 2021-2022, OEKO-TEX® issued more than 36,000 labels and certificates, and their webpages were viewed about three million times. As of 2022, 21,000 manufacturers, brands, and retailers in more than 100 countries work with OEKO-TEX® to ensure that their products are tested for potentially harmful substances, and millions of consumers globally use the OEKO-TEX® labels to guide their purchasing decisions.

### 3.4. Advocacy and Awareness Raising

This grouping captures advocacy efforts and other campaigns that aim to raise awareness of the need for and benefits of informed substitution. These campaigns may target regulated industry, retailers, governments, or consumers, and accordingly, they employ a variety of tactics. Some approaches (e.g., Chemical Footprint Project and Mind the Store) rely on public disclosure of chemical use or chemical management information, whether by the company itself or by a third-party evaluator, and then use that information to benchmark, or grade, the company in an effort to drive continuous improvement towards safer chemistries. Other approaches (e.g., Detox My Fashion) take a more direct approach by calling on manufacturers to commit to phasing out specific hazardous chemicals over time. Still others (e.g., NyKemiLov.nu and Safer States) pursue legislative approaches, proposing or supporting government action to enact chemical bans, require chemical disclosure, or conduct further research.

Whether an approach is targeting regulated industry, government, or another entity, it almost always includes some element of outreach and awareness-raising to the general public, which further increases the impact of the campaign as companies and governments face pressure from their consumers or constituents to provide safer products.

#### 3.4.1. *Chemical Footprint Project*

Clean Production Action  
*United States*

The Chemical Footprint Project aims to leverage the disclosure of chemical data to transform global chemical use. The Project provides benchmarking for the measurement of chemical footprints (total mass used of chemicals of high concern) for companies, services, events, buildings, and products. Signatories, such as NGOs, engage with the Project by signing on to encourage business participation. The Project primarily engages with businesses (Responders) that complete a chemical footprint, and subsequently evaluates Responders' performance. Chemical footprint information may be used by investors, retailers, and purchasers. Thirty Responders participated in 2020.

<https://www.chemicalfootprint.org/>

#### 3.4.2. *Detox My Fashion*

Greenpeace  
*The Netherlands*

Greenpeace's Detox My Fashion campaign targets the fashion industry's rapid manufacture and disposal of clothing and release of hazardous chemicals into water bodies globally. The website provides resources to learn more about the adverse consequences of fast fashion, particularly in the Global South, as well as successes of brands who have joined the campaign. Companies who join the Detox campaign committed to phasing out certain hazardous chemicals over time, and the program emphasizes safer chemical alternatives and avoiding regrettable substitution. Eighty brands and companies have made commitments under the campaign.

<https://www.greenpeace.org/international/act/detox/>

### **3.4.3. NyKemiLov.nu**

Coop Danmark A/S  
*Denmark*

The NyKemiLov.nu campaign focuses on removing problematic chemicals from consumer products in favor of safer alternatives. Garnering over 21,000 signatures through a public campaign and video, the campaign created a proposal calling for increased research on the effect of exposure to many chemicals (“the cocktail effect”) and bans for entire groups of problematic substances (fluorinated substances and bisphenols). The proposal and signatures were delivered to legislators, who took up many of the key points in a joint chemicals initiative.

<https://www.nykemilov.nu/>

### **3.4.4. Safer States**

Safer States  
*United States*

Safer States is a partnership among U.S. environmental health organizations focused on reducing exposure to harmful chemicals. Safer States focuses on legislative approaches at the state level, providing a tracker of relevant policies in development, those that have been implemented, and a ranking of “states in the lead.” The campaign focuses on a select group of hazardous chemicals through five strategies: chemical bans, administrative actions, chemical disclosure, corporate accountability, and federal engagement. Safer States reported that from January-July 2022, at least 22 policies were passed across 13 states.

<https://www.saferstates.org/>

**Mind the Store**

Mind the Store 

*Toxic-Free Future*

*United States*

<https://saferchemicals.org/mind-the-store/>

**Overview:** The Mind the Store campaign, implemented by the Safer Chemicals Healthy Families program of the organization Toxic-Free Future, works with retailers, fights for policy, and educates the public to raise awareness of and phase out hazardous chemicals. Safer Chemicals Healthy Families was founded in 2009 and draws support from hundreds of diverse businesses and organizations, including international non-governmental organizations, bloggers, and reproductive health and labor organizations. The Mind the Store campaign was initiated as a tactic to “drive the chemical industry to the table” by creating pressure on chemical companies’ retail market share.

**Intended audiences:** Major retailers, consumers.

**How the approach works:** Focused on large retailers in the U.S. and Canada, the Mind the Store campaign aims to “drive a competitive race to the top” by challenging retailers to eliminate harmful chemicals from consumer products. Annually, the organization publishes a “Retailer Report Card” for a selection of retailers, which assigns an overall grade based on achievement related to safer chemicals. Mind the Store ranks retailers (selling articles, formulated products, food, etc.) based on points accumulated. The reports evaluate retailers against 13 criteria including whether the retailer has a safer chemicals policy, requires suppliers to disclose chemicals in products, evaluates safer alternatives and avoids regrettable substitution, and takes action to reduce chemicals or plastics of high concern. Within the “safer alternatives” category, for example, retailers gain significant points by commissioning or requiring suppliers to conduct hazard assessments on chemicals of high concern, while minimal points are given to retailers with policies that prefer safer alternatives but have no clear guidance for selection.

To further pressure retailers, the campaign focuses on a select group of chemicals and chemical classes of high concern for which they publish media releases targeting specific retailers for their continued use of harmful chemicals (or highlighting retailers’ elimination of those chemicals). For example, a campaign in 2021-2022 repeatedly highlighted companies’ policies on per- and polyfluoroalkyl substances (PFAS, commonly known as “forever chemicals”). In doing so, Mind the Store goes beyond brand ranking to educating consumers on the importance of chemical substitution and the risks they may face from everyday products.

**Required expertise and resources:** Retailer Report Cards are publicly available and offer both a simplified overall grade and more extensive analysis across all 13 criteria. Resources for consumer education are also available through Safer Chemicals Health Families.

**Use and impacts:** While it is challenging to attribute corporate actions to the Mind the Store campaign alone, a 2021 study found that nearly 70% of companies surveyed by the campaign had improved their hazardous chemical safety programs, notably substituting out PFAS in many cases (Toxic-Free Future, 2021).



### 3.5. Education and Professional Associations

The approaches in this grouping include collaboration programs, professional associations, and other forms of knowledge sharing and capacity building. These approaches allow practitioners and other stakeholders to access and exchange information relevant to chemical substitution, and they facilitate collaboration on needed scientific and methodological advances. Due to their multi-stakeholder nature, they interface with and support various aspects of the chemical substitution landscape, including regulated industry and government as well as many other types of third-party approaches.

These approaches are diverse in terms of the subject matter they cover, their audiences, and their specific activities and tactics. While all of these approaches advance the field of informed substitution, their content areas of focus range from hazard assessment to toxicology, public policy, green chemistry, educational curricula, environmental justice, specific chemicals of concern, and others. The target audiences or participants for each approach also vary, with some focusing specifically on scientists (e.g., IPCP) or educators (e.g., Beyond Benign) and others focusing more broadly on non-governmental organizations, businesses, governments, or other stakeholders (e.g., A4 and BizNGO). These approaches also represent a diversity of tactics, from activities that aim to provide education, professional development, and networking to a group of members (e.g., A4); to activities that focus on creating educational materials and courses (e.g., Beyond Benign and ISC3); to activities that result in the dissemination of policy-oriented reports or letters (e.g., IPCP and BizNGO).

#### 3.5.1. *Beyond Benign*

Beyond Benign  
*United States*

Beyond Benign creates and disseminates sustainable science and green chemistry education resources to encourage the practice of sustainability in chemistry. The organization provides workshops to improve educators' skills and tools, an online community for educators to share resources, and open-source curriculum. To further advance green chemistry education, Beyond Benign maintains the Green Chemistry Commitment for higher education institutions, which has over 50 current signatories. Curricula are freely available and range from primary school to higher education, focusing on topics like toxicology, biomimicry, and organic chemistry.

<https://www.beyondbenign.org/>

#### 3.5.2. *BizNGO*

Clean Production Action  
*United States*

BizNGO is an informal network of non-governmental organizations and businesses that supports the creation and adoption of safer chemicals and materials, including through policy initiatives, education, and outreach. The organization maintains work groups on chemicals management; sustainable materials; hazard assessment; public policy; and diversity, equity, inclusion, and environmental justice. BizNGO hosts an annual meeting to bring collaborators together and gathers signatories on safer chemical and ingredient disclosure principles. There is a fee for annual meeting attendance, but membership is open and free for those who commit to BizNGO's principles for safer chemicals.

<https://www.bizngo.org/>



### **3.5.3. International Panel on Chemical Pollution (IPCP)**

International Panel on Chemical Pollution  
*Switzerland*

The IPCP collects scientific information on priority topics in chemical pollution to connect science with policy and the public. The ICPC is a network of international scientists collaborating on projects across a range of topics (e.g., greater transparency in polymer disclosure, PFAS, endocrine disrupting chemicals) that may inform chemical substitution efforts. Members meet yearly at a general assembly and through working groups to produce reports that may be distributed to the public, governments, and interested parties. IPCP's website provides model letters to policymakers, recorded workshops, and full reports that are freely available.

<https://www.ipcp.ch/>

### **3.5.4. International Sustainable Chemistry Collaborative Centre (ISC3)**

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)  
*Germany*

ISC3 fosters the transition of chemical-related sectors to sustainable chemistry, promoting a circular economy to implement sustainability throughout product life cycles and change stakeholder behavior. Taking a multi-stakeholder approach, ISC3 contributes globally to international chemicals policy, develops professional and academic trainings, offers advisory services, fosters innovations, supports entrepreneurship, and conducts research. ISC3 launched two master's programs in sustainable chemistry, provides certificate courses and summer school, and offers workshops, masterclasses, and trainings in vocational settings. Various educational events are posted on ISC3's calendar, and compiled reports are available on the website.

<https://www.isc3.org/>

## Association for the Advancement of Alternatives Assessment



*Lowell Center for Sustainable Production, University of Massachusetts Lowell*

*United States*

<https://saferalternatives.org/>

**Overview:** The Association for the Advancement of Alternatives Assessment (A4) is an interdisciplinary professional organization that aims to advance the practice, science, and policy of informed substitution and alternatives assessment. These goals directly respond to the needs that A4 has identified: accelerated alternatives assessment methods development, more robust tools, clear standards of quality, and expanded practice of informed substitution and alternatives assessment.

**Intended audiences:** Academia, industry, nonprofit organizations, government agencies.

**How the approach works:** The A4 community spans across professions, and collectively these members work toward the use of safer chemicals and materials. A4 members represent the fields of toxicology, engineering, chemistry, economics, law and policy, exposure science, and others. Both students and professionals can join. A4 lists membership benefits including the opportunity to shape the methodological development of alternatives assessment, share research and practices across disciplines, access educational content, and make change by informing decision making.

A4 hosts webinars—notably a quarterly series—on tools, interdisciplinary connections, market research, and other topics. At least once every two years, A4 hosts a symposium focused on one of its broad goals. Past symposia have concentrated on growing the field of alternatives assessment or accelerating the innovation of alternatives themselves through development of best practices across policymaking, methodology, and tool development. Through its quarterly newsletter, the community also highlights other workshops, webinars, and conferences of interest to its members, ranging from certification courses on toxics use reduction to industry-specific policy. A4 provides an index of resources, from both government and non-government sources, to support alternatives assessment and informed substitution. Members can also join discussion groups. Current discussion engages with a variety of sub-topics on incorporating alternatives assessment into policy on both a national and international level.

**Required expertise and resources:** Membership in A4 is paid, with dues varying for students and professionals. The slides and full recordings of many webinars, including one on OECD's Guidance on Key Considerations for the Identification and Selection of Safer Chemical Alternatives, as well as past symposia are freely available on A4's website.

**Use and impacts:** As noted on its website, A4 is the "only professional association solely dedicated to advancing the science, practice, and policy of alternatives assessment and informed substitution." A4's webinars and symposia have been well attended—the latter receiving sponsorship by a variety of state and federal government programs, various industry organizations, and third-party organizations.

### 3.6. Retailer Strategies

This grouping captures approaches used by retailers to both reduce the volume of hazardous chemicals in the products they sell and educate their customers about purchasing products without chemicals of concern. These approaches represent efforts across diverse product sectors, including textiles and apparel, furniture, and formulated consumer products.

Some retailer approaches (e.g., Walmart) leverage chemical ingredient and chemical footprint disclosure as a tool to move toward safer chemistries, either through influence and competition among manufacturers and/or through market signals or other pressure from informed consumers. Others (e.g., IKEA, Levi Strauss & Co., and Coop) directly restrict the sale of products containing chemicals of concern, such as through RSLs. These restrictions may be based on authoritative lists of chemicals of concern, or they may use additional data and assessments to go beyond the current state of chemical regulation. For example, Coop works directly with scientists to identify and take action on emerging chemicals of concern, including a ban on PFAS in their private-label products in 2014. Walmart, rather than banning chemicals outright, instead encourages its suppliers to reduce or eliminate their use of certain priority chemicals, and the retailer publicly reports its annual reduction in the volume of priority chemicals in its formulated products.

Other retailers (e.g., Amazon) leverage ecolabels or other product rating systems to enable and encourage their customers to choose safer and more sustainable products, putting market pressure on suppliers to make safer options available rather than directly requiring those changes. Regardless of the specific tactics, what these retailer approaches share is their ability to send important demand signals up the supply chain to product manufacturers and chemical suppliers, who must increasingly engage in chemical substitution in order to have a market for their products.

#### 3.6.1. Coop's Safer Chemistry Initiatives

Coop Danmark A/S  
*Denmark*

Coop is a large, cooperatively-owned consumer goods retailer that in 2014 banned the use of PFAS in all their private-label products. The company implemented a testing limit and leveraged a third-party certification to ensure that products did not exceed established levels. Coop similarly phased in a ban of bisphenols in their private-label products. In 2019, Coop banned fluorinated chemicals in all cosmetics it carries, which gained national and international attention. Coop communicates directly with scientists to enable faster action on chemicals of concern than would be possible through regulation.

[https://dtsc.ca.gov/wp-content/uploads/sites/31/2020/01/2\\_1remote\\_MaleneBlume\\_CoopDenmark\\_PFCS\\_Jan2020\\_V2.pdf](https://dtsc.ca.gov/wp-content/uploads/sites/31/2020/01/2_1remote_MaleneBlume_CoopDenmark_PFCS_Jan2020_V2.pdf)

#### 3.6.2. IKEA's Restricted Substances List (RSL)

IKEA  
*The Netherlands*

IKEA is a global furniture manufacturer and retailer that emphasizes safer chemistry across product lifecycles. IKEA provides information on chemicals in products, phases out hazardous substances, and supports compliance in their supply chain. The retailer's RSL is a key part of its efforts, banning certain heavy metals, PFAS, organotin chemicals, and others. Select product-specific chemicals are also restricted (e.g., carcinogenic dyes in textiles), and certain chemicals require approval from IKEA (e.g.,

biocides, wood preservatives). IKEA's biocides policy reflects the evolving nature of the list—antimicrobials were scrutinized following the COVID-19 pandemic.

[https://www.ikea.com/us/en/files/pdf/2a/0f/2a0f5e67/ikea\\_restricted\\_substance\\_list.pdf](https://www.ikea.com/us/en/files/pdf/2a/0f/2a0f5e67/ikea_restricted_substance_list.pdf)

### **3.6.3. Levi Strauss & Co.'s Approach to Safer Chemicals**

Levi Strauss & Co.  
*United States*

Levi Strauss is an apparel manufacturer and retailer that began pursuing safer chemistry with wastewater effluent standards in the 1990s and a restricted substances list (RSL) in 2000, and has “moved from a risk-based evaluation of chemicals to one based on hazards.” The company has also collaborated with other textile and apparel brands and retailers to implement the Zero Discharge of Hazardous Chemicals (ZDHC) RSL across the industry. Levi Strauss' Screened Chemistry program examines the company's highest-use chemicals, turning to a list of safer substitutes when possible and spurring innovation towards safer alternatives.

<https://www.levistrauss.com/sustainability-report/consumption/safer-chemicals/>

### **3.6.4. Walmart's Sustainable Chemistry Commitment**

Walmart  
*United States*

Walmart, a large, multinational retailer, moves towards safer chemistries through its Sustainable Chemistry Commitment, which involves embracing green chemistry principles, supporting product ingredient disclosure, and working with third-party certifications. Walmart has prioritized the reduction of a set of priority chemicals (taken from various authoritative lists) and reported a 17% decrease in the use of these chemicals from 2017-2020. The retailer directs its suppliers to accelerate replacement of its priority chemicals and encourages use of third-party certifications. Walmart publicly discloses this information through the Chemical Footprint Project.

<https://corporate.walmart.com/esgreport/esg-issues/safer-healthier-food-other-products>

## Climate Pledge Friendly



Amazon

United States

<https://www.amazon.com/b?ie=UTF8&node=21221607011>

**Overview:** One of the largest retailers in the U.S., Amazon co-founded and signed on to The Climate Pledge in 2019, committing to net-zero annual carbon emissions by 2040. As part of Amazon’s climate efforts, they introduced their Climate Pledge Friendly initiative to reduce waste and provide customers with sustainable shopping options. Climate Pledge Friendly identifies products certified by one or more of the sustainability certifications (third-party or Amazon-created) that are recognized by Amazon as being “reputable, transparent, and have a focus on preserving the natural world.” Separate from Climate Pledge Friendly, Amazon also has a chemicals policy, including an RSL.

**Intended audiences:** Consumers, retailers, manufacturers.

**How the approach works:** The external certifications receiving the Climate Pledge Friendly badge include those administered by nonprofit organizations, governmental agencies, and independent laboratories. Given the broad nature of Amazon’s criteria for this badge, not all of these certifications focus on safer chemicals, or on climate. However, several of these certifications are highly relevant in the context of chemical substitution, including:

- **U.S. EPA Safer Choice**—certifies products that contain safer ingredients for human and environmental health
- **OEKO-TEX® Made in Green**—identifies textiles made without certain harmful substances and produced with reduced environmental impacts
- **MADE SAFE®**—certifies products made without ingredients known or suspected of causing harm to health or the environment
- **Cradle to Cradle Certified®**—assesses products across multiple environmental impacts, including material health (risks and hazards of ingredients)
- **TCO Certified**—assesses information technology products against multiple criteria, including requirements to restrict and reduce certain hazardous substances
- **EWG VERIFIED™**—identifies consumer products without EWG’s chemicals of concern

**Required expertise and resources:** To obtain the badge, interested retailers or manufacturers must obtain one of the listed certifications from a third party or from Amazon, which may be paid. Consumers shopping on Amazon may view all products with the Climate Pledge Friendly Badge or shop for products with a specific certification.

**Use and impacts:** Through Climate Pledge Friendly, Amazon customers can both see products with these various certifications and identify the products certified under a specific program. By providing visibility through Amazon’s product platform, the program may increase consumer awareness of and demand for ecolabels that emphasize safer chemicals and support chemical substitution. As of October 2021, over 200,000 products from at least 10,000 brands had the Climate Pledge Friendly badge across various product categories (e.g., electronics, grocery, apparel, and beauty).

# 4 Synthesis of Lessons Learned

The 33 approaches to supporting chemical substitution that are covered in this report (which represent only a small subset of existing approaches) illustrate the wide range and diversity of third-party approaches and the important roles they play in the field of informed substitution and alternatives assessment. The six groupings identified in this report are meant to help organize and make sense of this landscape. Collectively, these approaches cover many different aspects of managing and reducing chemical risk and are targeted toward a variety of audiences—from providing tools and frameworks that help practitioners conduct alternatives assessments, to implementing training and technical assistance for practitioners as well as communities and small businesses, building the capacity of the field through professional networks, stimulating market demand for retailers and manufacturers to provide safer chemistries, and helping consumers make informed purchasing decisions.

In reviewing these approaches from across the third-party chemical substitution landscape, a few features were identified that are common to many of the approaches:

- **Wide use and adoption across the community of practice, including governments, regulated industry, and other third-party organizations.** For example, GreenScreen® methods are widely used by a variety of stakeholders, from governments developing regulations to third-party organizations developing alternatives assessment frameworks, and have become a well-known component of the chemical substitution landscape.
- **Flexibility to respond to the latest science and methodological advances.** OEKO-TEX® demonstrates this in its approach to textile certification, which relies on “limit values” that are developed by a network of independent research institutes for both regulated and nonregulated substances, updated regularly, and may be more protective than governmental limits.
- **Unique element or approach that builds upon existing efforts.** For example, Climate Pledge Friendly built on existing work done by third-party and other ecolabels by developing an innovative way to display and filter product certification information on their retail website, making it easier for consumers to learn about and rely on those ecolabels and amplifying their impact.
- **Involvement of multiple stakeholders in development or implementation.** For example, PPRC provides technical assistance and training to a variety of stakeholders, including industry and local governments, and also brings stakeholders together through networking and through providing assistance for companies to achieve certification under the U.S. EPA Safer Choice program.
- **Ability to spur demand for safer chemicals and products in the marketplace.** Greenpeace’s Detox My Fashion campaign demonstrates this in its wide-reaching advocacy pushing brands toward safer chemicals in clothing, and it has been noted as an approach that is “stimulating market demand for the removal of toxic chemicals” (Tickner et al., 2019).

Many of these approaches expand their scope beyond chemical safety by also incorporating broader sustainability and product stewardship considerations across the product lifecycle. For example, A Framework to Guide Selection of Chemical Alternatives goes beyond hazard assessment to include steps for lifecycle considerations, accounting for possible impacts of a chemical from production to disposal. TCO Certified assesses products against criteria for socially and environmentally responsible

manufacturing such as supply chain transparency, responsible mineral sourcing, energy efficiency, and carbon footprint. BizNGO maintains member work groups on sustainable materials and environmental justice. And Amazon Climate Pledge Friendly leverages a wide variety of ecolabels to influence consumer purchasing patterns, including many that incorporate sustainability considerations. These and other approaches are increasingly important as the recognized need for sustainable chemicals continues to grow, as sustainability considerations become a more critical component of decisions about preferred alternatives, and as efforts like the EU's Safer and Sustainable-By-Design initiative are operationalized (Patinha Caldeira et al., 2022).

Even without considering government or regulated industry approaches, it is apparent that the existing landscape of approaches supporting informed substitution is extensive and diverse. Governments, when developing their own initiatives related to chemical substitution or engaging with stakeholders, should consider their role in this landscape and how their initiatives could complement, support, or build upon existing work across OECD member countries. Governments may also benefit from considering the common elements identified above that emerged from the approaches summarized in this report.

More concretely, a few ways that governments can adopt or support elements of third-party approaches are through addressing data gaps, leveraging third-party information on priority chemicals and alternatives, and taking advantage of government purchasing power. First, third-party approaches are impacted by limited data availability and a reliance on authoritative lists. Addressing data gaps will enable the broader field to advance and to rely on the most protective requirements possible, across many different approaches. While distinct from research and modeling on chemical hazard, transparency and disclosure requirements are another way to improve data availability to the benefit of advocacy campaigns and other stakeholders, whether through national programs such as the U.S. EPA's Toxics Release Inventory or state-level ingredient disclosure laws. Second, many third-party approaches produce scientific reports, compile priority chemical lists, and suggest or inform the development of innovative alternatives that go beyond current governmental policies and regulations. These resources provide valuable information that governments may benefit from as they consider future efforts to manage chemical risk. Lastly, governments can build upon and support existing third-party ecolabels by taking advantage of large-scale governmental purchasing power, which can have a significant impact in the marketplace (Tickner et al., 2019). Some governmental policies across OECD member countries already require government agencies to purchase safer products, which may be defined in terms of one or more ecolabels.

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The goal of this report is to characterize the current landscape of third-party (not government or regulated industry) approaches to chemical substitution across OECD countries, and in doing so, to provide information on those approaches that can be used by governments and other stakeholders to inform their chemical risk management efforts. This work responds to an ever-increasing focus on informed substitution and alternatives assessment brought about by government policies, market and supply chain factors, and consumer and worker concerns.

Collectively, these approaches cover many different aspects of managing and reducing chemical risk and are targeted toward a variety of audiences—from providing tools and frameworks that help practitioners conduct alternatives assessments, to implementing training and technical assistance for practitioners as well as communities and small businesses, building the capacity of the field through professional networks, stimulating market demand for retailers and manufacturers to provide safer chemistries, and helping consumers make informed purchasing decisions.

[oe.cd/chemicals-risk-management](https://oe.cd/chemicals-risk-management)

