Global Framework on Chemicals (GFC)
DRAFT Overview of Initiatives Identifying Priority Chemicals of Concern (CoCs)

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Introduction

Global Framework on Chemicals (GFC) Implementation Programme 2 (IP-2)

The Global Framework on Chemicals (GFC) Implementation Programme 2 (IP-2) focuses on strengthening economic and industry sector engagement along value chains.

The key focus areas of IP-2 are:

- Sectoral engagement: Targets key industrial sectors such as electronics, textiles, healthcare, and construction.
- Thematic workstreams: Operates across seven workstreams to integrate sound chemical management into business and manufacturing processes: transparency, traceability, and disclosure; occupational health and safety; priority chemicals of concern; chemical footprint approaches; green and sustainable chemistry; reporting standards and frameworks; and financing and investment.
- Value chain approach: Encourages private sector collaboration, lifecycle management, and the adoption of safer alternatives or sustainable chemistry innovations.
- Support and coordination: Facilitated through the Inter-Organization Programme for Sound Chemicals Management (IOMC), stakeholder webinars, and multi-sectoral dialogues.[1]

This review of priority chemicals of concern (CoCs) lists is part of the priority CoCs thematic workstream. In this context, the thematic workstream on Priority Chemicals of Concern (CoCs) aims to strengthen global understanding, alignment and action on hazardous chemicals through improved knowledge, guidance and cooperation. Building on initial scoping discussions, the current phase focuses on generating a consolidated mapping of existing regulatory and voluntary approaches that identify/prioritize/list CoC. Drawing on this mapping and its analysis, the workstream will then develop elements of guidance, as appropriate, on the identification of priority chemicals of concern. This work will support the achievement of economic and industry sectors in meeting GFC Targets, including Target D6, which calls for: “By 2030, sustainable chemical and waste management strategies have been developed and implemented for major economic and industry sectors that identify priority chemicals of concern and standards and measures, such as the chemical footprint approach, to reduce their impact and, where feasible, their input along the value chain.”

Objectives of this Overview of Priority Chemicals of Concern (CoCs) Initiatives

In the Global Framework on Chemicals (GFC) “priority chemicals of concern” is as a term of importance because Target D6 sets the need to develop and implement sustainable chemical and waste management strategies in major economic and industry sectors that include identifying “priority chemicals of concern” and reducing their impact and, where feasible, their input along the value chain.

The objectives of this overview of initiatives identifying priority chemicals of concern (CoCs) are to:

- Compile and analyse existing international, regional, national, and industry-specific lists of CoCs.
- Document the purpose, scope, and criteria used to identify CoCs, as well as commonalities and gaps.
- Review initiatives that identify CoCs for industry sectors.

Methodology

One hundred and sixty-one chemical listing initiatives developed by intergovernmental organizations (IGOs), governments, non-governmental organizations (NGOs), businesses, industry consortia, scientists, and trade associations were reviewed. Chemical lists were identified through:

- A survey of the Global Framework on Chemicals (GFC) stakeholders by the Inter-Organization Programme for the Sound Management of Chemicals (IOMC)
- A submission of lists from Habitable (a United States-based non-governmental organization), which has curated lists of hazardous chemicals over the past 20 years in its Pharos Hazard Lists database[2]
- Interviews of stakeholders active in the GFC industry sector workstreams

Note that this is not an exhaustive review of all CoC lists globally. It is a review of the more widely known and recognized industrial lists of CoCs, which are illustrative of the different criteria, purposes, and organizations that develop and maintain CoC lists.

Key questions asked of the lists were:

- Is the list voluntary or legally required?
- What is the geographic scope of the list?
- Which industry sectors are covered by the list?
- Who created the list?
- What criteria were used to include chemicals on a list?
- How is the list used?
- Is there a definition of “chemical of concern” or a similar term, such as “substances of very high concern”? And if yes, what is it?

Legal or Voluntary Status

The lists were assessed for their legal status, either being:

- Legally binding lists that require entities to take action based on state/provincial, national, and/or regional (for example, the European Union) laws and/or regulations. While international treaties, conventions, and protocols require ratification by national governments or regional regulations (for example, European Union), they are included herein as legally binding lists.
- Voluntary lists that were created by intergovernmental organizations (IGOs), businesses, non-governmental organizations (NGOs), labour unions, industry consortia, trade associations, or scientists, and have no legally binding status.

Geographic Scope

The lists were assessed for their geographic coverage, including:

- Global: the list is intended to be implemented world-wide; there is no geographical limitation;
- Regional: the list is intended to be implemented across multiple nations;
- National: the list is intended to be implemented within a single country;
- Provincial/State: the list is intended to be implemented within a province or state within a country.

Sector Coverage

The lists were assessed for the sector(s) for which the chemicals are relevant, including:

- All sectors: lists that had no sector limitation;
- Multi-sectors: covered many but not all sectors. For example, covering all sectors except agriculture, medical, or pharmaceuticals;
- Industrial: any sector involved in manufacturing;
- Specific sectors, including: building and construction, chemical/petrochemical, cosmetics, electronics, food, medical, retail, textile, and other consumer products, including children's, household, cleaning, and personal care products.

Organizational Entities that Created the Lists

The lists were assessed for the organization or individuals that created the list, including:

- IGOs
- Governments
- NGOs and trade unions
- Businesses—individual companies
- Industry consortia and trade associations
- Scientists publishing lists in journals or books

Criteria Used to include Chemicals on a List

The lists were assessed for the criteria used to determine which chemicals to include on the list, including:

- Chemical identity/structure/class: identify chemicals based on their molecular structure, composition, or membership in a defined chemical class
- Hazard-based lists:
    - Identify chemicals based on their environmental and/or human health hazards:
        - Environmental hazards: Chemicals identified based on adverse effects on the environment, such as ecotoxicity, persistence, or bioaccumulation
        - Human health hazards: Chemicals identified based on adverse effects on human health, such as acute toxicity, carcinogenicity, mutagenicity, reproductive toxicity, endocrine disruption, and/or neurotoxicity
        - Environmental and human health hazards: Chemicals identified based on adverse effects on both the environment and human health
    - Additional factors that may be attached with hazard, including functional uses or being on a regulatory list.
- Risk-based lists: identify chemicals based on the hazard properties together with actual or potential exposure and/or risk assessments
- Commercial status lists: identify chemicals based on their production, manufacture, import, export, sale, or use in commerce.

Uses of the Lists

The lists were assessed with respect to their use(s), including:

- Assessment lists are developed by systematically evaluating the hazards, exposures, risks, and/or safety of chemicals with the purpose of understanding their hazards and risks, and possibly to inform other actions listed below, such as for reporting, disclosure, or labelling.
- Characterization and/or classification lists are developed by assessing chemicals using any of the criteria listed above and assigning them:
    - Specific attributes, such as global warming potential or;
    - To a defined category or group/class, such as carcinogens or PFAS.

  The purpose of characterization/classification lists is to inform users of potential hazards/risks and/or to inform other actions, such as for reporting, disclosure, or labelling.
- Reporting, disclosure, and/or labelling lists are developed by identifying chemicals and/or their hazard/risk information in products, and then providing the information to governments, businesses, supply/value chains, the public, consumers, and/or end-of-life handlers of the products, including reusing, recycling, incinerating, or landfilling the products. The purpose of these lists is to inform decision making of the purchasers/users/handlers of the products.
- Prioritization lists are developed using any of the criteria listed above to set priorities for further action, including assessment, restriction/prohibition, and/or substitution.
- Restriction/prohibition lists are developed using any of the criteria listed above to limit (restricted) or not allow (prohibit) the production, uses, procurement, and/or sale of a chemical. Restrictions/prohibitions include the use of chemicals in a product—for example, a restricted substances list (RSL)or the use in manufacturing operations—for example, a manufacturing RSL (MRSL).
- Regulation/trade control lists are developed using any of the criteria listed above to set legally binding requirements governing the production, use, emissions, waste management, monitoring, and/or trade of chemicals on the lists. Note that other forms of regulation, including reporting/disclosure/labelling requirements and restrictions/prohibitions are addressed above.
- Approval lists are developed using any of the criteria listed above to assess and allow chemicals for production, use, procurement, and/or sale. While approval lists are not CoC lists, they are created using criteria that determine which chemicals are approved to be on or off the list.
- Inventory lists are typically developed on the basis of a chemical's presence in commercial applications, such as imports, production, manufacturing, products, and/or use. While inventory lists are not CoC lists, they are a starting point for knowing which chemicals are in production/use and can be combined with existing hazard/risk information.

Definitions of "Chemicals of Concern" or similar terms such as "Substances of Very High Concern"

To understand how entities define "chemicals of concern (CoCs)" or similar terms such as "substances of very high concern (SVHCs)," the GFC Survey asked respondents to provide their definitions. This review includes those definitions where provided as well as definitions of CoCs as defined by GFC's predecessor framework, the Strategic Approach to International Chemicals Management (SAICM) and the definition of persistent organic pollutants (POPs) as defined by the Stockholm Convention.

Overview of the Chemical Lists Reviewed

This overview of chemical lists addresses the questions highlighted in the methodology section above:

- Legal or voluntary status
- Geographic scope
- Sector coverage
- Organization entities that created the lists
- Criteria used to include chemicals on the lists
- Uses of the lists
- Definitions of "chemicals of concern" or similar terms such as "substances of very high concern."

One hundred and sixty-one chemical listing initiatives developed by intergovernmental organizations (IGOs), governments, non-governmental organizations (NGOs), trade unions, businesses, industry consortia, trade associations, and scientists were identified and reviewed.

Legal/Voluntary Status

Of the 161 lists reviewed:

- 83 were legally binding:
    - 43 lists were developed by national governments
    - 20 lists were developed for regional regulation, all by the European Union
    - 17 lists were developed by provinces/states in Canada and the United States (US): Quebec (two lists), California (six lists), and other US states (nine lists)
    - Three lists were developed under Multilateral Environmental Agreements (MEA): Montreal Protocol, Stockholm Convention on Persistent Organic Pollutants (POPs), and Rotterdam Convention, Prior Informed Consent (PIC) Annex III Chemicals
- 78 were voluntary lists:
    - 37 lists were developed by non-governmental organizations (NGOs) or trade unions
    - 12 lists were developed by governments, for example, for the classification and characterization of chemicals according to criteria aligned with the Globally Harmonized System for the Classification and Labelling of Chemicals (GHS)
    - 11 lists were developed by industry consortia or trade associations
    - Nine lists were developed by businesses for requirements of suppliers
    - Five lists were developed by IGOs, for example, for identifying per- and polyfluoroalkyl substances (PFAS) and endocrine disrupting compounds (EDCs)
    - Four lists were developed by scientists and published in peer reviewed journals

Geographic Scope

Of the 161 lists reviewed:

- 54 were global lists
- 24 were regional lists, all from Europe
- 66 were national lists
- 17 were state/provincial lists, all from Canada or the US

Sector coverage

Of the 161 lists reviewed:

- 67 covered all sectors—they had no sector limitation
- 21 were multi-sector, covering all sectors except agriculture or pharmaceuticals
- 10 covered the industrial sector, including chemical/petrochemical manufacturing
- Many lists covered specific sectors, including:
    - 17 covered cosmetic sector
    - 10 covered food sector
    - Eight covered consumer products, including children's, household, cleaning, personal care, and/or toy products
    - Seven covered building and construction sector
    - Seven covered electronic sector
    - Six covered textile sector
    - Four covered medical sector
    - Three covered retail sector (which includes consumer products, cosmetic, electronic, and/or textile sectors)
    - One covered firefighting foam sector

Criteria Used for including Chemicals on the Lists

Of the 161 lists reviewed:

- Two lists were developed on the basis of chemical identity, structure, or group/class
- 119 lists were developed on the basis of environmental/human health hazards and/or functions uses and regulatory lists
- 30 lists were developed on the basis of hazard and exposure/risk assessments
- 10 lists were developed on the basis of commercial status

See below for further details on these lists.

Chemical Identity/Structure/Class

Only two of the lists reviewed were solely created based on chemical identity/structure/class, and they were used to identify per- and polyfluoroalkyl substances (PFAS):

- Organization for Economic Cooperation and Development's (OECD) comprehensive global database of Per- and Polyfluoroalkyl Substances (PFASs)[3]
- United States (US) Environmental Protection Agency's (EPA) PFAS Chemical Lists[4]

Both of these lists were generated by either an intergovernmental organization (IGO)—OECD or a government (US EPA) to classify chemicals as to their status in the PFAS class of chemicals.

Hazard-based Lists

Hazard-based lists identify chemicals based on their environmental and/or human health hazards, and in some cases include other factors such as functional uses or being on a regulatory list. Hazard-based lists do not include exposure and/or risk assessments. The hazard criteria used to identify lists of chemicals were:

- Environmental hazards: Chemicals identified based on adverse effects on the environment, such as ecotoxicity, persistence, or bioaccumulation (18 lists). For example,
    - The German Federal Environment Agency (FEA) Ordinance on Facilities for Handling Substances that are Hazardous to Water identifies substances based on their ecotoxicological characteristics and assigns substances to define water hazard classes[5]
- Human health hazards: Chemicals identified based on adverse effects on human health, such as carcinogenicity, reproductive toxicity, or endocrine disruption (33 lists).
- Environmental and human health hazards: Chemicals identified based on adverse effects on both the environment and human health (24 lists).
- Hazard and/or functional uses: Chemicals identified based on their hazardous properties and/or their use in specific functions, applications, or product categories (36 lists).
- Hazards and being on a regulatory list: Chemicals identified based on hazardous properties and/or inclusion on one or more regulatory or authoritative lists (8 lists).

Risk-based Lists

Risk-based lists identify chemicals based on the hazard properties together with actual or potential exposure and/or risk assessments. In total, 30 of the lists were created using exposure/risk assessments, and 26 of those lists were generated by governments/IGOs and four were generated by trade associations.

Governments use risk-based lists for a wide variety of reasons, including:

- Assessment of chemicals (two lists), for example, the German MAK Commission evaluates substances-based health risks and derives recommended workplace concentration/biological tolerance values[6] and the Australia National Industrial Chemicals Notification and Assessments (NICNAS), which conducted human-health and environmental assessments of industrial chemicals, including new and priority existing chemicals[7]
- Assessment and approval of chemicals (three lists), for example, the China National Food Safety Standard[8] and US Food and Drug Administration's (FDA) Select Committee on GRAS (Generally Regarded as Safe) Substances[9] are two examples of lists of chemicals that were assessed for health risks and approved for use
- Assessment and prioritization of chemicals (three lists), for example, the California Biomonitoring Chemical List identifies candidate chemicals using information on exposure, toxicity, and public-health importance and selects designated/priority chemicals for biomonitoring[10]
- Characterization/classification and/or regulation of chemicals (seven lists), for example:
    - Canadian Environmental Protection Act (CEPA) toxic substances list—Schedule 1[11] identifies substances determined to be "toxic" under CEPA. While inclusion can lead to regulatory controls, the list establishes a defined regulatory status/category
    - Japan Chemical Substances Control Law, which requires the evaluation of new chemicals, reporting for existing chemicals, and governmental risk assessment and regulatory controls based on assessment results[12]
- Prioritization of chemicals (four lists), for example, the EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP), which prioritizes substances for evaluation to clarify concerns about risks to health or the environment [13]
- Reporting/disclosure/labelling and/or restrictions/prohibitions of chemicals (11 lists), for example:
    - EU Fragrance allergens labelling in cosmetics[14]
    - EU Substances restricted under REACH[15]

- Japan Class II Specified Chemical Substances under Japan's Chemical Substances Control Law (CSCL), which facilitates regulatory reporting and establishes legally-binding controls/restrictions[16]
- US FDA Prohibited & Restricted Ingredients in Cosmetics[17]

Commercial Status

Commercial status lists identify chemicals based on their production, manufacture, import, export, sale, or use in commerce. Ten of the lists were created using commercial status criteria, and all 10 lists were generated by governments. Note that a list generated using commercial status for determining whether to place a chemical on a list is not a CoC list.

The purpose of all 10 lists generated on the basis of commercial status was to create an inventory of chemicals in commerce in the country. For example, inventory lists may take stock of:

- All chemicals in industrial or commercial use in a country. For example:
  - Australian Inventory of Industrial Chemicals[18]
  - European Community (EC) Inventory[19]
  - Philippine Inventory of Chemicals and Chemical Substances[20]
- Chemicals used in a specific sector. For example:
  - China Inventory of Existing Cosmetic Ingredients (China IECIC)[21]
  - Food Packaging Forum's Food Contact Chemicals Database[22]

Uses of the Lists

The uses of the lists varied widely, including for assessment, characterization/classification, reporting/disclosure/labelling, prioritization, restriction/prohibition, trade control, and regulation. In some cases lists had multiple uses, for example, for both classification and labelling of chemicals.

Of the 161 lists reviewed:

- 14 lists were used to systematically assess the hazards/risks of chemicals (assessment lists)
- 40 lists were used to characterize/classify chemicals (characterization/classification lists)
- 22 lists were used to support the reporting, disclosure, and/or labelling of chemicals and/or their hazards (reporting/disclosure/labelling lists)
- 39 lists were used to prioritize chemicals for further action, including assessment, restriction/prohibition, and/or substitution (prioritization lists)
- 42 lists were used to restrict and/or prohibit the production, use, sale, or purchase of chemicals (restriction/prohibition lists)
- 15 lists were used to set legally binding requirements governing the production, use, emissions, waste management, monitoring, and/or trade of chemicals (regulation/trade control lists)
- Seven lists were used to assess and approve chemicals for use (approval lists)
- 13 lists were used to inventory chemicals in commerce (inventory lists)

Note, due to the fact that a single list can have multiple uses, there were a total of 192 uses of the 161 lists. See below for further details on these lists.

Assessment Lists

Of the 14 assessment lists, 11 were from governments, two were from trade associations, and one was from a business. Chemicals in assessment lists are typically subject to further actions based on the assessment. For example:

- The German MAK Commission evaluates substances and derives recommended workplace concentration/biological tolerance values, as well as evaluating carcinogenicity, reproductive toxicity, mutagenicity and other hazards. Its detailed documentation systematically reviews toxicological evidence. The assessments are used to inform workplace exposure regulations and occupational health protections.[23]
- The SC Johnson company created its Potential Skin Allergens list based on an analysis of 3,000 data sets from public and industry sources for potential skin allergens identified on country regulatory lists, fragrance industry lists, the European Scientific Committee on Consumer Safety reviews, dermatology clinic data and individual supplier safety data sheets. The company then shared its findings for validation with experts in the fields of dermatology, immuno-toxicology, fragrance toxicology and allergens. SC Johnson then uses that list to determine what to include as a skin allergen its product disclosures.[24]

Characterization/Classification Lists

Of the 40 characterization/classification lists reviewed, 24 were from governments, six were from IGOs, seven were from NGOs/unions, and three were from scientists. Characterization/classification lists include chemicals listed based on:

- Global warming potential value—for example, see the Intergovernmental Panel on Climate Change (IPCC) and US EPA.[25]

- Chemical structure to identify chemicals in the class of per- and polyfluoroalkyl substances (PFAS)—for example, see Organization for Economic Cooperation and Development (OECD)[26] and US EPA PFAS Chemical Lists.[27]
- Carcinogenicity, mutagenicity, and/or reproductive/developmental toxicity (CMR)—for example, see International Agency for Research on Cancer (IARC) monographs,[28] European Union (EU) Classification, Labelling and Packaging (CLP) Annex VI for CMRs,[29] California Proposition 65 list,[30] US EPA IRIS database,[31] US Report on Carcinogens,[32] US National Institute for Occupational Safety and Health (NIOSH) potential occupational carcinogens,[33] and breast carcinogens identified by J.E. Kay, et. al (2024)[34] and Silent Spring Institute.[35]
- Endocrine disruption—for example, see lists generated by the United Nations Environment Programme (UNEP),[36] EU,[37] and The Endocrine Disruption Exchange (TEDX).[38]
- Neurotoxicity—for example, see the lists generated by scientists: Grandjean and Landrigan (2006 and 2014);[39] and W.K. Boyes (2012).[40]
- Asthmagens—for example, see lists generated by the province of Quebec,[41] Association of Occupational and Environmental Clinics (AOEC),[42] and Habitable.[43]
- The Globally Harmonised System of Classification and Labelling (GHS)—many nations have developed databases based on GHS criteria. For example, see: Malaysia's Industry Code of Practice on Chemicals Classification and Hazard Communication,[44] New Zealand's Chemical Classification and Information Database,[45] and Republic of Korea's GHS Classification/Labelling database.[46]
- Persistent, bioaccumulative, and toxic (PBT); persistent organic pollutant (POP); very persistent and very bioaccumulative chemicals (vPvB); persistent, mobile, and toxic chemicals (PMT); very persistent and very mobile chemicals (vPvB)—for example, see EU's new hazard classes 2023[47] Stockholm Convention on POPs,[48] and Netherlands - Substances of Very High Concern.[49]
- Ozone depleting substances—for example, see Montreal Protocol on Substances that Deplete the Ozone Layer.[50]
- Quantitative structure activity relationship (QSAR) assessments—for example, see Denmark's Advisory List for Self-Classification of Hazardous Substances, which provides recommended hazard classifications based on (Q)SAR assessments.[51]
- Substances entering the environment at levels or under conditions that may cause environmental or human-health harm—for example, see Canada's Toxic Substances List[52] and Germany's Substances Hazardous to Water list.[53]
- Links between chemical contaminants and human diseases or conditions—see the Environment Toxicant and Disease Database developed by the Collaborative for Health.[54]

Reporting/Disclosure/Labelling Lists

Of the 22 reporting/disclosure/labelling lists reviewed, 18 were from governments, and one each were from an NGO/union, business, industry consortium, and trade association. For example:

- California Proposition 65: Chemicals are listed when California's qualified expert bodies or authoritative agencies determine that they cause cancer, birth defects, reproductive harm, or developmental toxicity. The list is hazard-based and relies on scientific evidence reviewed through state and recognized external processes.
- chemSHERPA Declarable Substance (JAMP): Substances are included when disclosure is required or recommended under laws, regulations, industry standards, or customer requirements relevant to product supply chains. The list focuses on substances that manufacturers need to communicate through material declarations.
- GHS-Malaysia: Chemicals are identified based on classification under the Globally Harmonized System (GHS), using standardized hazard criteria for physical, health, and environmental hazards. Substances are listed because they meet specified hazard classification thresholds.

- IEC 62474 - Material Declaration for Products of and for the Electrotechnical Industry: substances are included when they are subject to legal restrictions, reporting obligations, or industry-driven declaration requirements for electrical and electronic products. The list supports supply-chain disclosure and regulatory compliance rather than ranking hazards alone.
- SC Johnson - Potential Skin Allergens: Ingredients are identified based on evidence that they can cause skin sensitization or allergic skin reactions. The list draws on toxicological assessments and fragrance-allergen science to promote ingredient transparency and informed consumer choice.

Prioritization Lists

Of the 39 prioritization lists reviewed, 16 were from governments, 17 were from NGOs/unions/scientists, four were from businesses, and two were from industry consortia/trade associations. For example:

- California - Safer Consumer Products (SCP) - Candidate Chemicals: Chemicals are listed if they exhibit one or more hazard traits identified by California, including carcinogenicity, reproductive or developmental toxicity, endocrine activity, neurotoxicity, persistence, bioaccumulation, aquatic toxicity, or other significant human health or environmental hazards. The list draws heavily from authoritative governmental and scientific hazard assessments.
- Food Packaging Forum - Food Contact Chemicals of Concern (FCCoCL): Chemicals are identified based on recognized evidence of human health concern relevant to food-contact uses, including carcinogenicity, mutagenicity, reproductive toxicity, endocrine disruption, persistence, bioaccumulation, and other serious toxicological endpoints. The list compiles substances from authoritative regulatory and scientific hazard lists.
- Japan Priority Assessment Chemical Substances (PACS) under Chemical Substances Control Law: Chemicals are designated when available hazard information and estimated exposure suggest potential risks to human health or the environment that warrant further government assessment. Selection is based on both hazard and exposure potential rather than hazard alone.
- Perkins+Will - Precautionary List: Chemicals are included when credible scientific evidence indicates significant human health or environmental hazards, such as carcinogenicity, reproductive toxicity, endocrine disruption, persistence, bioaccumulation, or ecotoxicity. The list applies a precautionary approach, often identifying substances before regulatory action occurs.
- Washington State DoE – PBT: Chemicals are listed based on evidence that they persist in the environment, accumulate in living organisms, and cause toxicity to humans or wildlife. The primary criteria are persistence, bioaccumulation, and toxicity, either individually or in combination.

Restriction/Prohibition Lists

Of the 42 restricted/prohibited lists reviewed, two were from IGOs, 14 were from governments, 14 were from NGOs/unions, eight were from industry consortia/trade associations, and four were from businesses. For example:

- Google MRSL: Chemicals restricted in Google's hardware supply chain based on regulatory requirements, hazardous properties, environmental concerns, and safer-material substitution objectives.
- European healthcare’s phase-out list (EPOL) for chemicals of concern: Substances identified for substitution because of hazardous properties, especially CMR, PBT/vPvB, endocrine-disrupting, and other SVHC-like characteristics relevant to healthcare products and procurement.

- Ulta Beauty - Conscious Beauty Made Without List: Cosmetic and personal care ingredients identified as undesirable based on health, safety, environmental, or consumer preference concerns and excluded from qualifying products.
- ZDHC Manufacturing Restricted Substances List (MRSL): Chemicals identified as hazardous to workers, consumers, or the environment and therefore restricted from intentional use in textile, apparel, leather, and footwear manufacturing processes.

Regulation/Trade Control Lists

Of the 15 regulation/trade control lists reviewed, one was from an MEA and the remaining 14 were from governments. For example:

- The Rotterdam Convention - Annex III lists pesticides and industrial chemicals following decisions of the Convention's Conference of the Parties. The listed pesticides and industrial chemicals are subject to the Convention's PIC procedure. Chemicals may be listed following notifications of final regulatory actions by Parties to ban or severely restrict them for human health or environmental reasons, or following submissions of proposals to list severely hazardous pesticide formulations, subject to the criteria and procedures established by the Convention. Listing in Annex III triggers the PIC procedure for international trade, under which Parties communicate their decisions on whether to consent to future imports of the listed chemicals. [55]
- China's Limit of Harmful Substances of Industrial Protective Coatings (GB 30981-2020) identifies harmful substances by setting concentration limits for VOCs and specified hazardous chemicals and heavy metals in industrial protective coatings. Substances are regulated based on their hazardous properties and emissions potential, with compliance determined by whether coating formulations exceed prescribed thresholds.[56]
- Japan's Chemical Substances Control Law is the overarching chemicals law, requires evaluation of new chemicals, reporting for existing chemicals, governmental risk assessment, and regulatory controls based on assessment results.[57]

Approval Lists

Of the seven approval lists reviewed, five were from governments, one was from an NGO, and one was from a trade association. Note that, while approval lists are not CoC lists, they are created using criteria that determine which chemicals are approved to be on or off of a list.

For example: the United States (US) Environmental Protection Agency's (EPA) Safer Chemicals Ingredient List (SCIL) only includes chemicals that meet specified hazard thresholds—including for carcinogenicity, mutagenicity, reproductive/developmental toxicity, PBT properties, systemic toxicity, asthma, sensitization, endocrine activity, and authoritative CoC lists—appropriate to the functional use, with the objective of identifying safer chemicals by functional use.[58]

Inventory Lists

Of the 13 inventory lists reviewed, 12 were from governments and one was from an NGO. Similar to approval lists, inventory lists are also not CoC lists. Note that inventory lists are typically developed on the basis of a chemical's presence in commercial applications, such as imports, production, manufacturing, products, and/or use. While inventory lists are not CoC lists, they are a starting point for knowing which chemicals are in production/use and can be combined with existing hazard/risk information.

For example, inventory lists may take stock of:

- All chemicals in industrial or commercial use in a country (e.g., Australian Inventory of Industrial Chemicals,[59] EC Inventory,[60] or Philippine Inventory of Chemicals and Chemical Substances[61]) or
- Chemicals used in a specific sector such as the cosmetics (e.g., China IECIC—Inventory of Existing Cosmetic Ingredients in China[62]) or food sectors (e.g., the Food Packaging Forum's Food Contact Chemicals Database[63] and the US Food and Drug Administration (FDA) Inventory of Food Contact Substances,[64] which is both an approval and inventory list).

Organizational Entities that Created the Lists

Of the 161 lists reviewed:

- 8 lists were developed by IGOs
- 92 lists were developed by governments
- 37 lists were developed by NGOs and trade unions
- Four lists were developed and published in articles or books by scientists
- 11 were developed by industry consortia and trade associations
- Nine lists were developed by individual companies

Intergovernmental Organizations (IGOs)

Eight lists generated by IGOs/MEAs were reviewed. The criteria used by IGOs/MEAs to create lists were:

- Chemical identity/structure (one list)
- Environmental and human health hazards (six lists)
- Hazard and exposure/risk (one list)

The uses of the lists included:

- Characterization/Classification (six lists), including identifying and classifying chemicals on the basis of:
    - Global warming properties of chemicals— Intergovernmental Panel on Climate Change (IPCC) list of chemicals and their global warming potential values[65]
    - Carcinogenicity—International Agency for Research on Cancer—IARC[66]
    - Chemical structure to identify chemicals in the class of per- and polyfluoroalkyl substances (PFAS)—Organization for Economic Cooperation and Development—OECD[67]
    - Endocrine disruption—United Nations Environment Programme—UNEP[68]
- Prioritization (one list)—supporting countries in prioritizing chemicals for reduction and substitution. For example, the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic lists substances identified as threats to the marine environment and prioritized for action to minimize threats and eliminate releases[69]
- Restrictions/prohibitions (two lists)—supporting reduction, substitution, restrictions, and phase-outs of:
    - Ozone depleting substances under the Montreal Protocol on substances that Deplete the Ozone Layer[70]
    - Persistent organic pollutants (POPs) under the Stockholm Convention on POPs[71]
- Regulation/Trade Control (one list)—facilitating information sharing for certain hazardous chemicals and pesticides in international trade, with actions taken at the country level, under the Rotterdam Convention, Prior Informed Consent Annex III[72]

Note that some lists have multiple uses.

Governments

Ninety-two lists generated by governments were reviewed. The criteria used by governments to create lists were:

- Chemical identity/structure (1 lists)
- Commercial status (10 lists)
- Environmental hazards (14 lists)
- Human health hazards (20 lists)
- Environmental and human health hazards (18 lists)
- Hazard and exposure/risk (25 lists)
- Hazard and/or functional uses (four lists)

The uses of the lists included:

- Assessments (11 lists)
- Characterizations/classifications (24 lists)
- Prioritization (16 lists)
- Restrictions/prohibitions (14 lists)
- Reporting, disclosure, and/or labelling requirements, including communicating hazards to workers, downstream users, and the public (18 lists)
- Regulations/trade control (14 lists)
- Approval for commercial uses (five lists)
- Inventories (12 lists)

Note that some lists have multiple uses.

NGOs/Trade Unions

Thirty-seven lists generated by NGOs/unions were reviewed. The criteria they used to create lists were:

- Hazards and functional uses (25 lists)
- Human health hazards (eight lists)
- Hazards and regulatory lists (three lists)
- Environment and human health hazards (one list)

The uses of the lists included:

- Prioritizations (15 lists)
- Restrictions/prohibitions (14 lists)
- Characterization/classifications, including EDCs, chemical classes, and asthmagens (seven lists)
- Inventories (food contact chemicals), approvals (electronics), and reporting/disclosure/labelling requirements (electronics) (three lists)

Note that some lists have multiple uses.

Businesses

Nine lists generated by individual companies were reviewed. The business lists were from:

- Cosmetic companies: Credo Beauty,[73] Sephora,[74] and Ulta Beauty[75]
- Building and construction companies: Bora Architecture & Interiors[76] and Perkins+Will (architecture and design firm)[77]
- Electronics companies: Apple[78] and Google[79]
- Household and personal care, and cleaning products company: SC Johnson's list of allergens[80]
- Retail: Target's Restricted Substance List and Priority Chemical List[81]

The criteria they used to create lists were:

- Environment and human health hazards (four lists)
- Hazards and functional uses (three lists)
- Hazards and regulatory lists (one list)
- Human health hazards (one list)

The uses of the lists included:

- Assessment (one list)
- Prioritizations—identifying chemicals of concern for reduction, substitution, and management (four lists)
- Reporting/disclosure/labelling—communicating chemical requirements and priorities to suppliers (one list)
- Restrictions/prohibitions —communicating company-specific phase-outs, restrictions, and prohibitions (four lists)

Note that some lists have multiple uses.

Trade Associations and Industry Consortia

Eleven lists generated by trade associations and industry consortia were reviewed. The criteria they used to create lists were:

- Hazard and exposure/risk (four lists)
- Hazards and regulatory lists (four lists)
- Hazards and functional uses (three lists)

The uses of the lists included:

- Assessments (two lists)
- Reporting/disclosure/labelling (two lists)
- Prioritizations (two lists)
- Restrictions/prohibitions (eight lists)
- Approvals (one list)

Note that some lists have multiple uses.

Scientists

Four lists generated by scientists were reviewed. The criteria they used to create lists were:

- Human health hazards (three lists)

- Hazards and functional uses (one list)

Two of the lists identified neurotoxicants based on human health hazards,[82] and were published either in a book or a peer reviewed journal. Another list identified the class of brominated and chlorinated flame retardants in a peer reviewed journal.[83] And the fourth list identified endocrine disrupting compounds (EDCs) that are likely increase breast cancer risk.[84]

The uses of the lists included:

- Characterization/classification of chemicals in terms of neurotoxicity or breast cancer risks caused by EDCs.
- Prioritization of brominated/chlorinate flame retardants for substitution with safer alternatives.

Definitions of "chemicals of concern" or similar terms such as "substances of very high concern"

What follows below is a snapshot of how organizations in the lists reviewed defined "chemicals of concern (CoCs)" or similar terms such as "substances of very high concern (SVHCs)." Different entities and their lists define CoCs using different terms and somewhat different definitions. In addition, we start with the definition of CoCs from GFC's predecessor framework, the Strategic Approach to International Chemicals Management (SAICM).

Strategic Approach to International Chemicals Management (SAICM)

SAICM defined chemicals of concern (CoCs) as: "chemicals which, due to their inherent hazardous properties, present a known or reasonably suspected risk to human health and/or the environment."[85]

SAICM specified hazard properties for identifying CoCs in the Chemicals in Products Programme to include:

- Persistent, bioaccumulative and toxic substances (PBTs)
- Very persistent and very bioaccumulative substances (vPvBs)
- Chemicals that are carcinogens or mutagens or that adversely affect, among other factors, the reproductive, endocrine, immune or nervous systems [86]

The purpose for SAICM in defining and identifying CoCs was for the Chemicals in Products Programme to set priorities in "developing new tools and guidance to reduce the use of chemicals of concern" in specific sectors, including textiles, building materials, electronics and toys.[87]

SAICM distinguished between three categories of CoCs in the *International chemicals management toolkit for the toy supply chain*:[88]

1. Chemicals for which international risk reduction action has been agreed on via Multilateral Environmental Agreements (international conventions).
   The mandatory international agreements banning or restricting certain chemicals of concern are:
   - Stockholm Convention, Listing of POPs in the Stockholm Convention
   - Montreal Protocol, The Montreal Protocol on Substances that Deplete the Ozone Layer
   - Minamata Convention on Mercury
   - Rotterdam Convention, Annex III Chemicals
2. Chemicals for which scientific evidence exists to advance risk reduction action - this includes chemicals that are regulated at national or at regional level.

3. Chemicals for which the evidence for risk to human health or the environment is currently emerging from scientific research, but which are not yet regulated. “One example of emerging evidence is the hazardous property endocrine disruption. There is a growing concern about the extent of the risk posed by endocrine disrupting chemicals and calls for action to reduce such risks.”[89]

SAICM highlighted in the *International chemicals management toolkit for the toy supply chain* report that: “CoC of categories 1 and 2 are [already] subject to mandatory regulations (e.g. bans or limit values). Addressing the third category of CoCs can be part of a high-ambition and proactive approach to chemicals management and can go beyond regulatory compliance.”[90]

Stockholm Convention on Persistent Organic Pollutants (POPs)

The Stockholm Convention defines persistent organic pollutants (POPs) as substances that “possess toxic properties, resist degradation, bioaccumulate, and are transported, through air, water and migratory species, across international boundaries and deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems.”[91]

Annex D of the Stockholm Convention defines the information requirements and screening criteria to identify POPs to include:

- Persistence
- Bioaccumulation
- Potential for long-range environmental transport
- Adverse effects to human health or to the environment[92]

The purpose of identifying and listing POPs under the Stockholm Convention is to protect human health and the environment by eliminating, restricting, and reducing releases of these highly hazardous chemicals.

European Union (EU) REACH substances of very high concern (SVHCs)

SAICM’s hazard properties for CoCs are similar to the hazard properties developed by the European Union (EU) REACH regulation in 2007 for identifying “substances of very high concern” (SVHCs). According to the European Chemicals Agency (ECHA), under the REACH regulation:

“Substances with the following hazard properties may be identified as SVHCs:

- Substances meeting the criteria for classification as carcinogenic, mutagenic or toxic for reproduction (CMR) category 1A or 1B in accordance with the CLP Regulation.
- Substances which are persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) according to REACH Annex XIII.
- Substances on a case-by-case basis, that cause an equivalent level of concern as CMR or PBT/vPvB substances.”[93]

The purpose of SVHCs in EU REACH, which are part of the authorisation process, is to ensure that SVHCs “are progressively replaced by less dangerous substances or technologies where technically and economically feasible alternatives are available.”[94]

Definitions from IOMC Survey

Respondents to the IOMC Survey who provided definitions to “chemicals of concern,” which are included in Table 1 below.

Table 1. Definitions of "Chemicals of Concern" from responses to IOMC Survey							
Initiative Name	**Definition of CoC**	**Org type**	**Type of initiative**	**Criteria to identify CoCs**	**Purpose of List**	**Geographic scope**	**Relevant sectors**
AFIRM Packaging RSL v8 (2025)	Restricted substances in finished apparel and footwear packaging that pose risks to consumer health and the environment.	Industry consortium	Voluntary	Hazard + regulatory lists	Restricted/ Prohibited	Global	Textiles
AFIRM RSL v10 (2025)	Restricted substances in finished apparel and footwear products that pose risks to consumer health and the environment.	Industry consortium	Voluntary	Hazard + regulatory lists	Restricted/ Prohibited	Global	Textiles
Chemical Footprint Project - Chemical of High Concern (CoHC) Reference List v3 (Clean Production Action)	A chemical of high concern (CoHC) is: A carcinogen, mutagen, or developmental/reproductive toxicant; persistent, bioaccumulative, and toxic substance (PBT); very persistent and very bioaccumulative (vPvB); or any other chemical for which there is scientific evidence of probable serious effects to human health or the environment that give rise to an equivalent level of concern, such as endocrine disruption or neurotoxicity, or a chemical whose breakdown products result in a CoHC that meets any of the above criteria.	NGO	Voluntary	Hazard +/or functional use	Prioritization	Global	Multi-sector
ChemSec SIN List (Substitute It Now)	The SIN List identifies chemicals as "Substances of Very High Concern" based on REACH criteria. These are chemicals that pose serious threats to human health and the environment and should be removed (substituted) as soon as possible.	NGO	Voluntary	Hazard +/or functional use	Prioritization	Global	All sectors
Clean Electronics Production Network (CEPN) - Priority Chemicals	CEPN has identified the 1st, 2nd and 3rd Rounds of Priority Chemicals — process chemicals to be prioritized for elimination or substitution in electronics manufacturing and serve as an MRSL for the electronics industry. Priority Chemicals meet the following criteria: • Used within the selected focus area(s), if any • Meets CEPN High Hazard Criteria • Some indication of current use as a process chemical, or evidence of historical use, within the electronics industry • Some indication of potentially viable safer alternatives available	NGO	Voluntary	Human health hazard	Prioritization	Global	Electronics
Cradle to Cradle Certified (C2C) RSL	Substances restricted from intentional use in Cradle to Cradle Certified products based on hazard assessment across 24 human and environmental health metrics. Includes recognized PBTs, vPvBs, CMRs (carcinogenic, mutagenic, reproductive toxicants), SVHCs, and substances assessed as equivalent level of concern. Restrictions organized in three categories: (4.2.1) aligned with leading regulations, (4.2.2) chemical and functional use classes, (4.2.3) hazard endpoints and risk assessment.	NGO	Voluntary	Hazard +/or functional use	Restricted/ Prohibited	Global	All sectors
EU - Candidate List substances in articles	Substances of very high concern are substances that meet one or more of the following criteria (see Article 57 of the REACH Regulation): https://echa.europa.eu/documents/10162/17231/reason_for_inclusion_en.pdf/815e36fe-1fdf-3471-09d2-3a9f27370294	Government	Legally binding	Environmental + human health hazard	Prioritization + Reporting/ Disclosure/ Labelling	Regional	Multi-sector

EU - Overview of Alternatives Query (OAQ)	Facilitating the use of safer and more sustainable biocidal active substances	Government	Voluntary	Hazard + exposure/risk	Assessment + Prioritization	Regional	Multi-sector
EU - REACH Candidate list	A substance of very high concern (SVHC) is a chemical substance (or part of a group of chemical substances) which has been proposed as a candidate for inclusion on the Authorization or Restriction list of REACH.	Government	Legally binding	Environmental + human health hazard	Characterization/ Classification + Prioritization	Regional	Multi-sector
Health Care Without Harm Chemicals of Concern	(page 4-5) In this document the criteria for hazard identification of the chemicals listed are based on the impacts of the chemicals on human health and the environment. The parameters considered are listed below: Toxicity (e.g., carcinogen, mutagens, reproductive hazards); Endocrine disrupting chemicals (EDCs); Neurotoxicity, developmental toxicity and immuno-toxicity; Allergenicity/asthmagenicity; Sensitizer; Skin and eye irritants; Environmental determinants linked to persistent and bioaccumulative toxicants (PBTs) in the products, and acute/chronic aquatic toxicity	NGO	Voluntary	Hazard +/or functional use	Prioritization	Global	Medical
International Living Future Institute (ILFI)	The LBC Red List identifies chemicals representing the "worst in class" substances prevalent in the building industry that pose serious risks to human health and the environment. These include chemicals with hazard endpoints including cancer, reproductive toxicity, acute or chronic organ toxicity, endocrine disruption, environmental persistence, bioaccumulation, and ozone depletion.	NGO	Voluntary	Hazard +/or functional use	Restricted/ Prohibited	Global	Building and Construction
Japan - Class I Designated Chemical Substances under Japan's PRTR-SDS law	Substances that are harmful or potentially harmful to human health, or that may interfere with the inhabitation or growth of flora and fauna, or that may deplete the ozone layer, and that are recognized to continuously exist in the environment of a considerably wide area given their physical/chemical properties and manufacture/import/use/generation situation. Designated by Cabinet Order (PRTR-SDS law Article 2(2)).	Government	Legally binding	Hazard + exposure/ risk	Reporting/ Disclosure/ Labelling	National	Multi-sector
Japan - Class I Specified Chemical Substances under Japan's Chemical Substances Control Law (CSCL)	Substances that are persistent (not readily biodegradable), highly bioaccumulative, and that may cause long-term harm to human health or to higher predatory animals through continuous intake. Designated by Cabinet Order (CSCL Article 2(2)).	Government	Legally binding	Environmental + human health hazard	Restricted/ Prohibited	National	Multi-sector
Japan - Class II Designated Chemical Substances under Japan's PRTR-SDS Law	Substances meeting the same hazard criteria as Class I (harmful to human health, flora/fauna, or ozone layer) but expected to become continuously present in a wide environmental area due to potential increases in manufacture, import, or use volumes, rather than being currently present. Designated by Cabinet Order (PRTR-SDS law Article 2(3)).	Government	Legally binding	Hazard + exposure/ risk	Reporting/ Disclosure/ Labelling	National	Multi-sector

Japan - Class II Specified Chemical Substances under Japan's Chemical Substances Control Law (CSCL)	Substances that may cause long-term harm to human health or may interfere with the inhabitation or growth of flora and fauna, and that are recognized as posing such risk because they are significantly present, or are expected to become significantly present, across a wide area of the environment given their properties and manufacture/import/use situation. Designated by Cabinet Order (CSCL Article 2(3)).	Government	Legally binding	Hazard + exposure/ risk	Restricted/ Prohibited	National	Multi-sector
Japan - Monitoring Chemical Substances under Japan's Chemical Substances Control Law (CSCL)	Monitoring Chemical Substances are existing chemical substances (i.e. not new chemical substances) that are persistent (not readily biodegradable) and highly bioaccumulative, but for which it is not clear whether they have long-term toxicity to humans or to higher predatory animals. Designated by the Ministers of MHLW, METI, and MOE (CSCL Article 2(4)).	Government	Legally binding	Environmental hazard	Reporting/ Disclosure/ Labelling + Prioritization	National	Multi-sector
Japan - Priority Assessment Chemical Substances (PACS) under Japan's Chemical Substances Control Law (CSCL)	Substances designated by the Ministers of MHLW, METI, and MOE for priority risk assessment, where available knowledge does not clearly establish the absence of long-term toxicity to humans or flora and fauna, and where the risk of environmental pollution cannot be ruled out given the substance's properties and manufacture/import situation (CSCL Article 2(5)).	Government	Legally binding	Hazard + exposure/ risk	Prioritization	National	Multi-sector
Japan - Surfactants for Environmental Monitoring (Japan Soap and Detergent Association)	"Surfactants are used in a wide variety of household and personal care products as well as in industrial chemicals, et cetera. Large amounts of surfactants used as detergents, fabric softeners are discharged into wastewater systems or directly into aquatic environment, such as a river. In order to assess the environmental risks of the surfactants, JSDA has been conducting environmental monitoring of surfactants in Japan since 1998."	Trade association	Voluntary	Hazard +/or functional use	Assessment	National	Household & Personal Care, Cleaning Products
Japan - The JCIA Standards for Volatile silicones (Japan Cosmetic Industry Association)	As some hair care products containing volatile silicones have been known to interfere with the normal operation of fan heaters used indoors, we have established a voluntary standard to refrain from including volatile silicones and to include a warning label. Please refer to the link for further details.	Trade association	Voluntary	Hazard + exposure/risk	Reporting/ Disclosure/ Labelling + Restricted/ Prohibited	National	Cosmetics
Japan - The List of JCIA Standards for Tar Colours (Japan Cosmetic Industry Association)	We in the cosmetics industry aim to contribute to solving social and environmental challenges by using chemicals appropriately to prevent potential risks and by continuing to utilise them. We recognise that the selection and management of CoC on a risk-based basis is the objective of both SAICM and the GFC.	Trade association	Voluntary	Hazard + exposure/risk	Restricted/ Prohibited	National	Cosmetics
Japan - Voluntary restrictions on the manufacture and sale of Lead Paints (Japan Paint Manufacturers Association)	Lead compounds intentionally added or exceeding specific concentration limits in targeted paints	Trade association	Voluntary	Hazard +/or functional use	Approval + Restricted/ Prohibited	National	Chemicals / Petrochemical

Pharos Database (Habitable)	Pharos is a compilation of 100s of Global Chemical Hazard Lists, Restricted Substances Lists, and Country Inventories for >200,000 chemicals. Pharos summarizes the data to assign hazard levels (E.g. High, Moderate, Low Concern) and Confidence Levels in the data (High or Low) for 24 hazard endpoints (e.g. carcinogenicity, bioaccumulation, ozone depletion potential). Pharos also contains functional use data, physical chemical properties, synonyms, and process chemistry data (what chemicals are used to make that chemical or material).	NGO	Voluntary	Hazard + regulatory lists	Characterization/ Classification + Prioritization	Global	All sectors
ZDHC Manufacturing Restricted Substances List (MRSL)	The ZDHC MRSL identifies chemical substances banned from intentional use in manufacturing processes across textile, leather, apparel, footwear and other sectors. It is a science-based list with clearly defined maximum concentration limits for restricted chemicals, addressing chemicals of concern at the input stage (upstream in manufacturing) rather than in finished products.	NGO	Voluntary	Hazard +/or functional use	Restricted/ Prohibited	Global	Textiles

Summary of Findings

The lists reviewed were primarily generated by entities based in developed countries. The Global South was most represented in the development of GHS classification lists and chemical inventory lists. Additionally, while not captured in the lists reviewed, the Global South is represented in the IGO/MEA lists, for example, as they are Parties to the Stockholm Convention and/or Rotterdam Convention.

Hazard-based criteria were the dominant basis for creating all lists. Of the 161 lists reviewed:

- 74% were hazard-based (without exposure/risk assessments) (119 lists)
- 19% were risk-based (30 lists)
- 7% were based on chemical identity/structure/class and commercial status (12 lists)

Governments/IGOs

Governments and IGOs developed 62% of all the lists reviewed (100 lists). They were the only entities that:

- Created lists spanning all the uses of CoC lists, including inventories, assessments, prioritizations, disclosures, regulations, and trade control.
- Created legally binding requirements, including in connection with IGOs.

Risk-based Criteria

Governments and IGOs dominated the development of risk-based lists. They developed 87% of these lists (26 lists), with industry consortia/trade associations developing the remaining 13% of risk-based lists (four lists).

Geographic Scope and Sectors Covered

The lists developed by governments and IGOs covered all the geographic areas assessed, including:

- 100% of the provincial/state lists (17 lists)
- 92% of the regional (multi-country) lists (22 lists)
- 82% of the national lists (54 lists)
- 13% of the global lists (seven lists).
    - The global lists were dominated by NGOs/unions/scientists, which accounted for 65% of the lists (35 lists)
    - Industry consortia/trade associations/businesses accounted for the remaining 22% of the global lists (12 lists)

Governments/IGOs were most likely to develop lists that covered multiple sectors:

- 81% of their lists covered all sectors, multi-sectors, or industrial sectors (81 lists)
- The remaining 19% of lists (19 lists) covered individual sectors including:
    - Cosmetics (8%)
    - Consumer products—children's, household, cleaning, personal care, and/or toy products (6%)
    - Food (4%)
    - Electronics (1%)

Uses of Lists

Governments/IGOs dominated the development of lists for:

- Assessment
    - 79% of assessment lists (11 lists)
    - Industry consortia/trade associations/businesses developed the remaining 21% of these lists (three lists)
- Characterization/Classification
    - 75% of characterization/classification lists (30 lists)
    - NGOs and scientists developed the remaining 25% of these lists (10 lists)
- Reporting/disclosure/labelling
    - 82% of all lists (18 lists)
    - Industry consortia/trade associations/businesses/NGOs developed 18% of these lists (four lists)
- Regulation/trade control—100% of all the lists
- Approval
    - 71% of approval lists (five lists)
    - Industry consortia/trade associations/ NGOs developed the remaining 29% of these lists (two lists)
- Inventory
    - 92% of all lists (12 lists)
    - An NGO developed 8% of these lists (one list)

NGOs/Unions/Scientists

NGOs/unions/scientists were the most active groups in creating lists of CoCs beyond governments:

- They created 26% of the lists reviewed (41 lists). Of those 41 lists, NGOs developed 36 lists, scientists developed four lists, and a trade union developed one list.
- Together governments/IGOs and NGOs/unions/scientists accounted for 88% of all the lists reviewed, with industry consortia/trade associations/businesses accounting for the remaining 12% of lists.

Hazard-based Criteria

All of the NGO/union/scientist lists were developed on basis of hazard criteria (without exposure/risk assessments):

- 63% were based on hazard/functional uses (26 lists)
- 27% were based on human health hazards (eight lists)
- 7% were based on hazard/regulatory lists (three lists)
- 2% were based on environmental and human health hazards (one list)

Geographic Scope and Sectors Covered

NGOs/unions/scientists were most active and dominant in creating lists of CoCs that are global in scope. Their lists represented 65% of the global lists (35 lists). They also had a few national (four lists) and regional lists (two lists).

NGOs were most likely to develop lists that covered single sectors:

- 72% of the NGO lists covered single sectors (26 lists), with the greatest focus on:
    - Food sector with 17% of the lists (six lists)
    - Building/construction + electronics + medical with 33% of the lists (four lists for each sector)
    - Textile (thee lists) + retail (two lists) + cosmetics (two lists) with 18% of lists
    - Notably, none of the NGO lists explicitly covered consumer products as defined as children's, household, cleaning, personal care, and/or toy products. Governments overwhelmingly addressed these sectors, representing 75% of lists covering these sectors.
- 28% of the NGO lists covered all sectors/multi-sectors (10 lists)

Scientist-generated lists (four lists) and a trade union list was relevant to all sectors.

Uses of Lists

Among the uses of lists, NGOs/unions/scientists were most active in:

- Characterization/classification—developed 25% of these lists (10 lists)
- Prioritization—NGOs/unions/scientists developed 42.5% of these lists (17 lists), which equalled the number of prioritization lists developed by governments/IGOs. Industry consortia/trade associations/businesses developed the remaining 15% of the lists (six lists).
- Restriction/prohibition—NGOs/unions/scientists developed 33% of these lists (14 lists), which was slightly less than the 38% of these lists developed by governments/IGOs (16 lists) and slightly more than the 29% of these lists developed by industry consortia/trade associations/businesses (12 lists).

These three uses of lists accounted for 95% of all the uses of lists developed by NGOs/unions/scientists (41 lists).

Prioritization and restriction/prohibition were the two uses of lists for which governments/IGOs were not the majority sources of the lists.

Industry Consortia/Trade Associations/Businesses

Criteria for Identifying CoCs

Industry consortia, trade associations, and businesses were most active in developing lists based on:

- Hazard and functional uses: representing 30% of their lists (6 lists)
- Hazard and regulatory lists: representing 25% of their lists (5 lists)
    - This is the one criterion where these organizations dominated, accounting for 63% of all lists based on hazard and regulatory lists
- Hazard and exposure/risk: representing 20% of their lists (four lists)
    - All four of these lists were developed by trade associations
    - Trade associations and governments/IGOs were the only organizations to develop risk-based lists
- Environmental and human health hazards: representing 20% of their lists (four lists)
- Human health hazards: representing 5% of their lists (one list)

Geographic Scope + Sectors Covered

The lists developed by industry consortia, trade associations, and businesses were global or national in scope:

- 60% of their lists (12 lists) were global
- 40% of their lists (eight lists) were national

The sectors covered by their lists were all individual sectors:

- Cosmetics (seven lists)
- Building and construction (three lists)
- Textile (three lists)
- Chemical / petrochemical (two lists)
- Consumer products as defined as children's, household, cleaning, personal care, and/or toy product (two lists)
- Electronics (two lists)
- Retail (one list)

Uses of Lists

Industry consortia, trade associations, and businesses used lists of CoCs for:

- Restrictions/prohibitions: 48% of their lists were for this purpose, including restricted substances lists (RSLs) and manufacturing (MRSLs) (12 lists)
- Prioritization of chemicals for elimination or substitution, meaning it is not a requirement as in a RSL or MRSL) but is preferred, represented 24% of their purposes for using lists (six lists)
- Reporting, disclosure, and labelling: 12% of their lists were for this purpose (thee lists)
- Assessment of chemicals for risks or human health hazards: 12% of their lists were for this purpose (three lists)
- Approval for use: 4% of their lists were for this purpose (one list)[*]

Definitions

Of the 26 survey responses to the IOMC survey, organizations with definitions of CoCs that aligned with the definitions of CoCs by SAICM, POPs by Stockholm Convention, and SVHCs by the EU were:

- Chemical Footprint Project definition of “chemicals of high concern” (created by Clean Production Action)
- ChemSec SIN List
- Clean Electronics Production Network (CEPN) - Priority Chemicals
- Cradle to Cradle Certified (C2C) RSL
- Health Care Without Harm Chemicals of Concern
- International Living Future Institute (ILFI), Living Building Challenge, Red List
- Pharos Database of Hazard Lists (created by Habitable)
- ZDHC MRSL

Notable is that all of these definitions were generated by NGOs.

[*] Note that some lists have multiple purposes

Concluding Remarks

This review of 161 CoC lists found that most were developed by organizations in developed countries and were overwhelmingly based on hazard criteria rather than risk assessments, with 74% of lists relying solely on hazard-based approaches.

Governments and IGOs were the dominant source of CoC lists, producing 62% of all lists reviewed and serving as the primary developers of inventories, assessments, classifications, disclosure requirements, approvals, regulations, and trade-control measures. They were also responsible for nearly all risk-based lists and the only entities creating legally binding requirements.

NGOs, unions, and scientists generated an additional 26% of lists and were particularly active in developing globally scoped lists, as well as prioritization, characterization, and restriction/prohibition lists, all of which were hazard-based.

Industry consortia, trade associations, and businesses accounted for 12% of lists and focused largely on sector-specific tools such as restricted substances lists (RSLs), manufacturing restricted substances lists (MRSLs), and chemical prioritization programs.

Across all list types, governments/IGOs and NGOs/scientists together accounted for 88% of the lists reviewed, demonstrating that public-sector and civil-society actors remain the principal sources of CoC identification and management frameworks, while industry-developed lists are more focused on sector implementation and supply-chain management.

Annex 1: Inventory of Initiatives Reviewed

1. AFIRM Packaging RSL v8 (2025)
2. AFIRM RSL v10 (2025)
3. American Apparel and Footwear Association Restricted Substance List (AAFA RSL)
4. ANSI/BIFMA - e3/level Annex B list of chemicals
5. Apple - Regulated Substances Specification
6. Asthmagens – Association of Occupational and Environmental Clinics (AOEC)
7. Asthmagens - Habitable
8. Australia - National Industrial Chemicals Notification and Assessments (NICNAS)
9. Australian Inventory of Industrial Chemicals
10. Bora - Chemicals of Concern List
11. California - DTSC - Biomonitoring California Chemical List
12. California - EPA - Prop 65
13. California - Food Safety Act
14. California - Safe Cosmetics Program - Reportable Ingredient List
15. California - Safer Consumer Products (SCP) - Candidate Chemicals
16. California - Toxic-Free Cosmetic Act
17. Campaign for Safe Cosmetics' Red List of Chemicals of Concern
18. Canada - CEPA DSL
19. Canada - CEPA Toxic Substances (Schedule 1)
20. Canada - Health Canada Cosmetic Ingredient Hotlist
21. Canada - Virtual Elimination List
22. Clean Electronics Production Network (CEPN) - Priority Chemicals
23. Chemical Footprint Project - Chemicals of High Concern (CoHCs) Reference List v3 (Clean Production Action)
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43. EU - Endocrine Disruptors List
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45. EU - GHS (H-Statements) Annex 6 Table 3-1
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47. EU - Overview of Alternatives Query (OAQ)
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