The Restriction Roadmap
– How to make effective use of this opportunity

The continued presence of hazardous chemicals in consumer articles, still 15 years after REACH came into force, is a failure. A survey from 2020 found that 84% of EU citizens rightfully worry about this. The Chemical Strategy from 2020 recognizes the gravity and sets a clear ambition of improvement.

Considering the work intensive and time-consuming process ahead to get a revised REACH and CLP in place, the concept of a Restriction Roadmap was introduced. It means to tackle the problem as far as possible within the current system, while awaiting a new.

The chemical strategy commits to:
"Extend the generic approach to risk management to ensure that consumer products – including, among other things, food contact materials, toys, childcare articles, cosmetics, detergents, furniture and textiles - do not contain chemicals that cause cancers, gene mutations, affect the reproductive or the endocrine system, or are persistent and bioaccumulative. In addition, immediately launch a comprehensive impact assessment to define the modalities and timing for extending the same generic approach, with regard to consumer products, to further harmful chemicals, including those affecting the immune, neurological or respiratory systems and chemicals toxic to a specific organ.
In the meantime, while the generic approach to risk management is not in place, prioritise all the above-listed substances for restrictions for all uses and through grouping, instead of regulating them one by one."

In other words, these restrictions should cover *all* of the below-mentioned properties in *all* types of consumer products.

- Carcinogens, Mutagens and substances toxic to Reproduction (CMRs)
- Endocrine Disrupting Chemicals (EDCs)
- Persistent, Bioaccumlative and Toxic Chemicals (PBTs)

We welcome this idea and find it of outmost important to efficiently and swiftly get these new restrictions in place. The grouping approach is key here, but also to effectively use the already available information, in order to achieve these necessary and broad restrictions in a reasonable amount of time.

ChemSec, together with CHEMTrust and ClientEarth, suggest using a parallel approach and to immediately start the restriction process with chemicals already officially identified as having the above-mentioned properties, while in parallel establishing the group approach:

- **Restrict all classified CMRs (categories 1a and 1b) for all uses in all consumer articles**, using the REACH 68.2 fast-track approach.
- **Restrict all identified SVHCs on the Candidate list in all consumer products**. The information needed for this restriction should be available already through the SVHC dossiers and the SCIP database. The main substance properties covered

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from this action, will be EDCs, PBTs and PMTs, as the CMRs are covered by the fast track approach.

- **Restrict all SIN List chemicals using a group approach** by targeting priority substance groups, explained below.

The SIN List* is a useful tool to identify further substances that are not classified yet but have similar properties, and to introduce a group approach.

In the lack of official CLP classification of EDCs, PBTs and PMTs – the SIN Lit has since years provided a list of the most hazardous chemicals. Substances have been listed after their properties were confirmed by a rigorous scientific evaluation based on publicly available and peer-reviewed data.

The SIN List has been divided into groups of substances that share similar properties, that can be used as framework for the restrictions. A group approach should mean that all chemicals within this group are covered by the restriction unless, for an individual chemical, it can be scientifically proven beyond doubt that it does not share the hazardous properties of the group. It is the only way to prevent the endless substitution of one hazardous chemical with one of its equally hazardous cousins.

We propose to first restrict the following groups, all included in the SIN List:

- **Fluorinated compounds**: Including PFAS, called "forever chemicals" due to their extreme persistence in the environment. Widespread use in everything from dental floss to clothes and firefighting foams.
- **Phthalates**: Mainly used as softeners in plastics. Endocrine disrupting chemicals damaging fertility, mainly in men. Migrates easily from flooring, toys, prints, food packages or any material they are used in.
- **Bisphenols:** Endocrine disrupting chemicals. Widely used in consumer products and frequently found in biomonitoring of both environmental samples and human tissues.
- **Halogenated compounds**: Including the infamous brominated flame retardants. The toxic properties are several, including carcinogenicity, persistence and endocrine disruption. The chemicals are intentionally added to products to achieve flame retardance, but easily migrates over long distances.
- **Toxic metals and metalloids:** A group of well-known toxics like arsenic, lead and cadmium.
- **Alkylphenols:** Includes nonylphenol ethoxylates, used in detergents and widespread in the environment where the endocrine disrupting properties cause problems.

Continue restricting classified chemicals

When new hazard categories are in place under CLP in addition to EDC, PBT, PMT, for immunotoxicity and neurotoxicity among others, classified substances should automatically be restricted in consumer products.

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Uses, properties and definitions of the SIN List Groups

Fluorinated compounds/PFAS[1]

Concern: It goes without saying that these forever chemicals are the talk of the town and new scandals linked to their omnipresence are published almost every day. It is their high persistence which makes them widespread over the world, either through water or in living organisms. The more well studied chemicals in this group are known to cause cancers, developmental disorders and more.

Use: Textile and leather impregnation products are the major applications for highly fluorinated substances, such as all-weather clothing, tents, shoes, rugs, upholstered furniture and awnings.
Other uses for highly fluorinated compounds are coatings on paper and paper-based food packaging, non-stick coatings (like Teflon), floor polishes, window cleaners, car care products, ski waxes, lubricants and fire foam of type B. Some PFAS may also be found in cosmetic products.

Phthalates[2]

Concern: Several phthalates are identified SVHCs or are partly restricted in consumer products. There have been previous, unsuccessful attempts to tackle phthalates as a group, but now is the opportunity to finally do it. Despite regulation, banned phthalates in toys are in top of the RAPEX register. It is time to go tougher on the whole group.
Many phthalates affect the development of the unborn child and they can also affect the ability of women and men to have children. Research shows how phthalates interact with the steroid hormonal system, and based on their chemical structure most phthalates are likely to have similar effects. Many phthalates are also very toxic to aquatic life, and several of them also cause long-lasting effects.

Uses: Phthalates are commonly added as plasticisers to hard plastics to make the material soft, increase flexibility, prevent cracking and facilitate moulding by lowering its melting temperature. Phthalates are primarily used in PVC plastic but are also used in rubber. The concentration of phthalates are sometimes a whopping 40 percent of the finished product.

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[1] PFAS are defined as fluorinated substances that contain at least one aliphatic carbon atom that is both, saturated and fully fluorinated, i.e. any chemical with at least one perfluorinated methyl group (-CF3) or at least one perfluorinated methylene group (-CF2-), including fluoropolymers (such as PTFE) and side chain polymers.

[2] Phthalates contains esters of phthalic acid. It can be discussed if the restriction should only include so called ortho-phthalates.

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The largest amounts of phthalates are found in flooring, wallpapers, electricity cables and foil.
A further complicating fact is that phthalates migrate easily from the original material and end up in dust, human blood and in the environment.

Bisphenols[3]

Concern: While Bisphenol A (BPA) has long been the posterchild chemical for endocrine disruption it was only recently identified and classified as a CMR and a Substance of Very High Concern. Many bisphenols are classic examples of regrettable substitution, where the attention brought on BPA has led to substitution with Bisphenol S and F, which are just as problematic as BPA. Monitoring levels in the environment and in humans show the urgency to tackle this whole group.

Uses: The most widespread function associated with bisphenols is in polycarbonate and epoxy polymers. Bisphenols can also be found in flame retardants, UV stabilisers, pH indicators or as a developer in thermal printing.

Halogenated compounds[4]

Concern: In this group we find the infamous brominated flame-retardants, known for their problematic properties and for having avoided legislation after production shifted to chemical cousins in the same group. This group of chemicals is diverse and may lead to a long list of different effects on health and environment.

Uses: Polyhalogenated compounds can have a range of properties including flame-retarding, plasticising, biocidal, fat-dissolving, water-repellent, cooling and/or lubricating. Chloroparaffins (such as SCCP) can act as plasticisers, lubricants and/or as flame retardants. Chlorophenols (such as PCP) have mainly been used as a multifunctional biocide.

Toxic metals and metalloids

Concern: In this group we find substances that even a person with zero chemical knowledge immediately recognizes as toxic: arsenic, mercury and lead.

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[3] Bisphenols contain compounds in which two phenols are bridged with one carbon or heteroatom. The bridge-atom can be oxidized or substituted with hydrogen, alkyls, phenyl and esters. The phenol oxygens are unsubstituted.

[4] Polyhalogenated alkanes contains brominated and/or chlorinated alkanes. The number of halogens is three or more, distributed over two or more carbons. At least two carbons are halogenated. There are at least one halogen/five carbons.
Polyhalogenated alkenes contains brominated and/or chlorinated alkenes. The double bond is substituted with two or more halogens.
Polyhalogenated aromatics contains brominated and/or chlorinated aromatic compounds with one benzene ring with at least three halogens or two or more benzene rings with at least two halogens on each ring.

But even though these are well known toxic compounds, many in this group are not close to being properly regulated. We find no reason why any of the metal compounds below should not be immediately restricted from consumer products:

- Antimony
- Arsenic
- Beryllium
- Boron
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Mercury
- Nickel
- Organotin

In humans and other mammals, the toxic effects of many metals include neurological damage, immune system suppression, foetal abnormalities and the development of cancers. Metal contamination poses a serious threat to microorganisms, animals and plants in the environment. Several of the metals in this group are essential in trace levels in biological systems while being toxic at higher doses.

Uses: Toxic metals are included in a wide range of materials and compounds with a range of functions. The most prevalant uses are as:

- components in metal alloys for stability, workability, appearance or semiconductor properties;
- metal plating for protection or shininess;
- in catalysts;
- in pigments;
- oxides with specific properties such as flame-retardance, semiconductance or insulation, biocidal or for bleaching;
- part of other inorganic compounds resulting in specific materials like silicate glass;
- part of organic compounds with specific effects such as biocides, fertilisers, catalysts or stabilisers in polymers.

Alkylphenols[5]

Concern: These are endocrine disrupting chemicals and many alkylphenols are also toxic to aquatic organisms. Several compounds and subgroups of alkylphenols are already listed as SVHCs or restricted. Still, alkylphenols are causing many problems in the environment.

[5] Contains phenols with lipophilic alkyl groups of at least four carbons attached to the aromatic ring with a carbon-carbon bond in the ortho and para position. The aromatic ring can contain other functional groups as well. The phenol oxygen is unsubstituted or ethoxylated.

Uses: Alkylphenols are used extensively in detergents, fuel lubricants, fragrances, thermoplastic elastomers and fire-retardant materials. Alkylphenol residues are found in products such as tyres, adhesives, carbonless copy paper and high-performance rubber products.

The SIN List

Since 2008, the SIN (Substitute It Now) List provides a concrete list of chemicals that, according to ChemSec analysis, fulfils the criteria set out in the REACH regulation for Substances of Very High Concern.

The SIN List is widely known and used. In the last year the SIN List has had more than 40 000 users from 177 countries, representing companies from chemical producers to large multinational brands, authorities, NGOs, Universities, Ecolabels and Financial investors.

www.sinlist.org

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