



European Union Reference Laboratory for alternatives to animal testing

Chapter 2



Elisabet Berggren, Joint Research Centre, European Commission
Swaccs course *Regulatory Toxicology II: European and International Perspectives*,
23 January 2024

THE ECOSYSTEM OF CHEMICALS LEGISLATION

Vertical legislation:



Horizontal legislation:

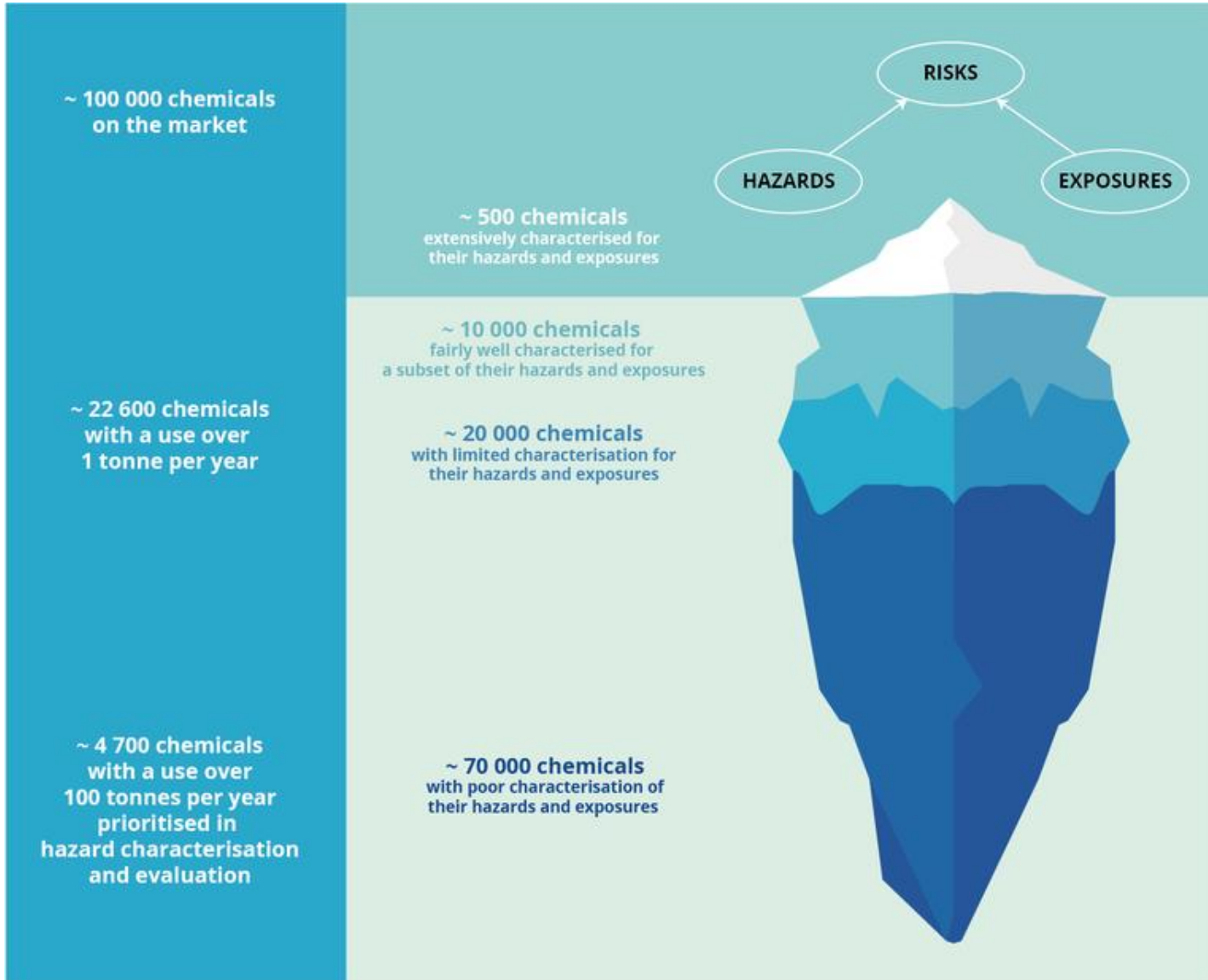
CLP - all chemicals on the market (no information requirements)

REACH

Registration & Evaluation > 1 tonnes
(information on systemic health effects +
chemical safety report > 10 tonnes)
Authorisation & Restriction based on concern

Downstream legislation

Evolving chemical environment



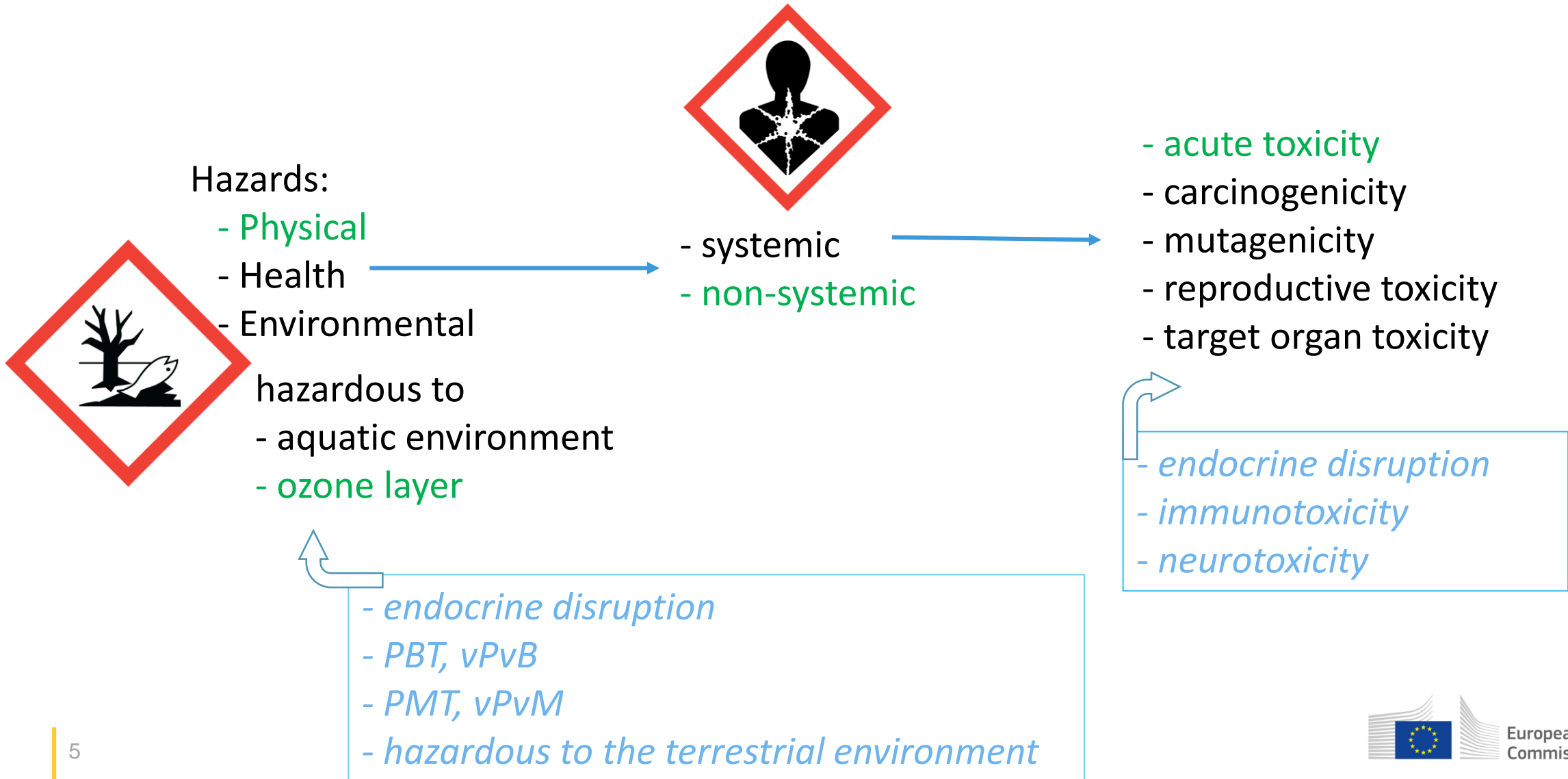
What we know - tip of the iceberg



<https://www.eea.europa.eu/soer>



GLOBALLY HARMONISED SYSTEM FOR CLASSIFICATION & LABELLING



Substances identified as endocrine disruptors at EU level*

(complete list 108 substances)

25 substances with ED Health effects:

11 substances harmonised classified Repr. 1b

1 substance harmonised classified STOT RE 1

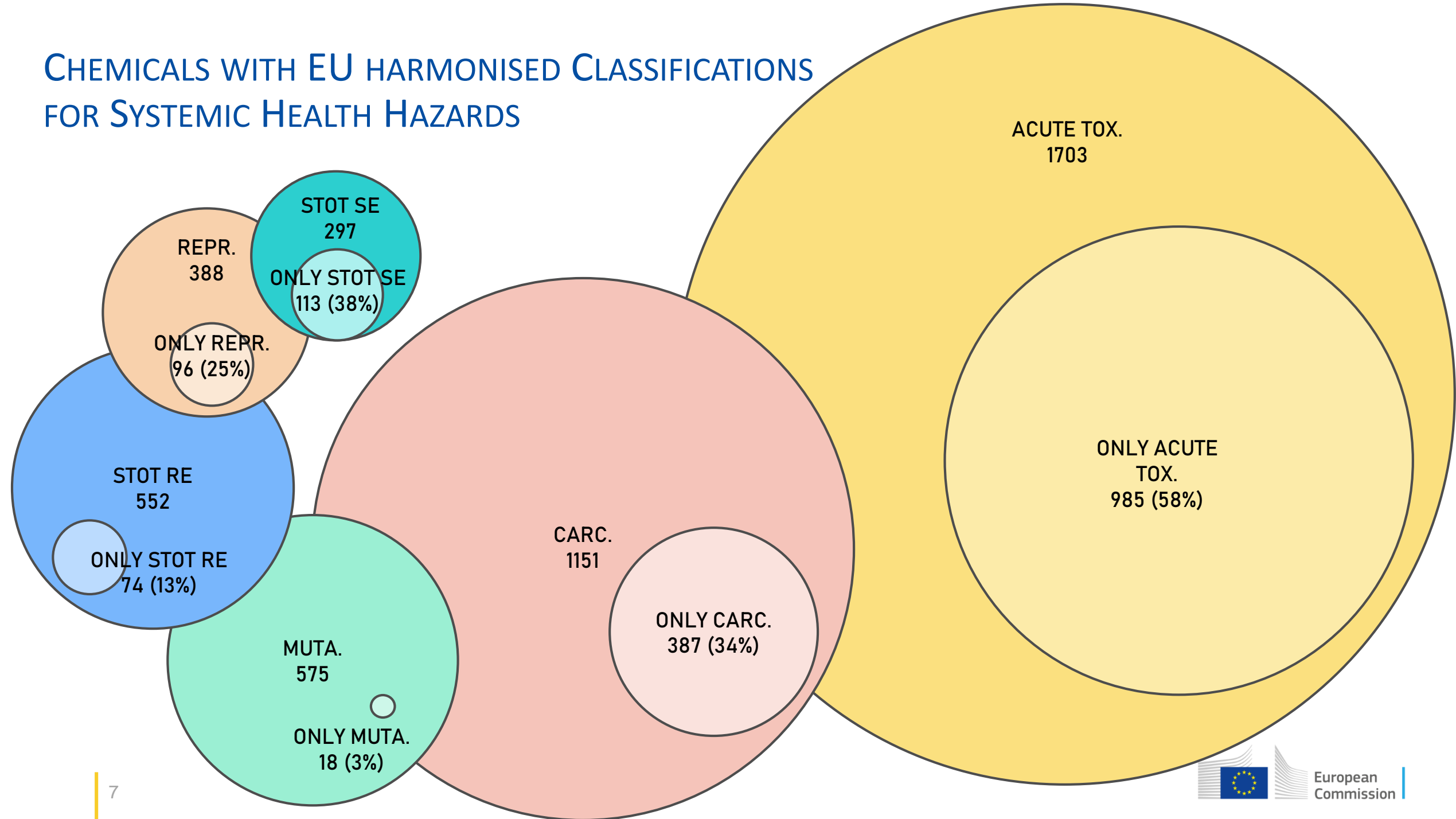
1 substance harmonised classified Asp. Tox. 1

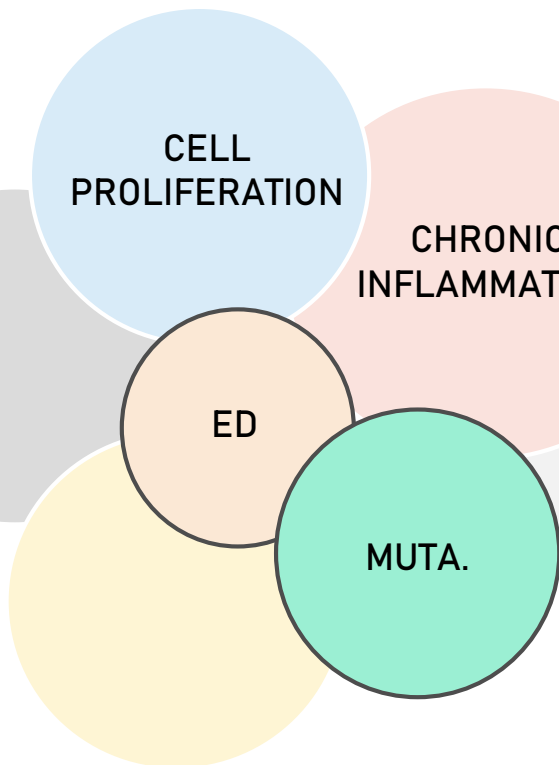
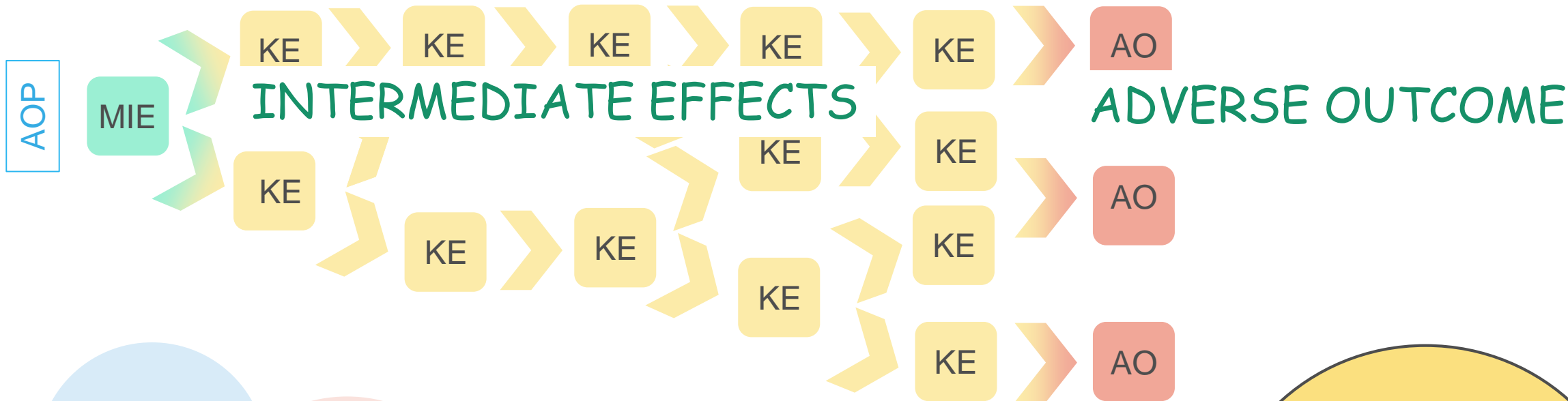
1 substance harmonised classified Aquatic acute & chronic 1, but without health class

11 substances without harmonised classification,
9 with similar structure to other EDs on the list + 2 REACH registered substances with no self-

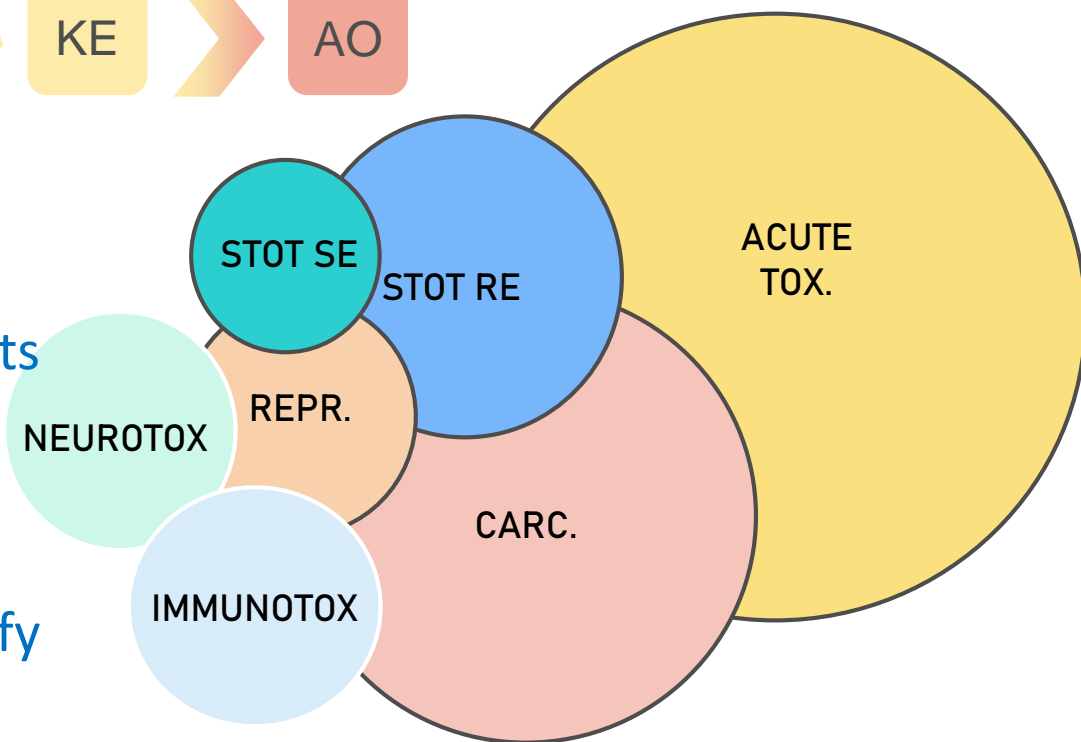
* <https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu>

CHEMICALS WITH EU HARMONISED CLASSIFICATIONS FOR SYSTEMIC HEALTH HAZARDS





- Identify intermediate effects leading to adverse outcome
- Stop predicting adverse outcome
- Avoid redundancy & identify gaps upstream
- Keep current protection levels





Chemicals 2.0 – a long-term objective for chemical safety assessment



What do we want to achieve?

- consider all chemicals on the market* & evaluate them according to concern
- minimise animal testing during “phase-out” period
- eventual aim of complete replacement



Towards a future regulatory framework for chemicals in the European Union – Chemicals 2.0

Elisabet Berggren, Andrew P. Worth*

European Commission, Joint Research Centre (JRC), Ispra, Italy

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CLP
New approach methodology (NAM)
REACH
Regulatory toxicology
Roadmap
Risk management

ABSTRACT

The body of EU chemicals legislation has evolved since the 1960s, producing the largest knowledge base on chemicals worldwide. Like any evolving system, however, it has become increasingly diverse and complex, resulting in inefficiencies and potential inconsistencies. In the light of the EU Chemicals Strategy for Sustainability, it is therefore timely and reasonable to consider how aspects of the system could be simplified and streamlined, without losing the hard-earned benefits to human health and the environment.

In this commentary, we propose a conceptual framework that could be the basis of Chemicals 2.0 – a future safety assessment and management approach that is based on the application of New Approach Methodologies (NAMs), mechanistic reasoning and cost-benefit considerations. Chemicals 2.0 is designed to be a more efficient and more effective approach for assessing chemicals, and to comply with the EU goal to completely replace animal testing, in line with Directive 2010/63/EU.

We propose five design criteria for Chemicals 2.0 to define what the future system should achieve. The approach is centered on a classification matrix in which NAMs for toxicodynamics and toxicokinetics are used to classify chemicals according to their level of concern. An important principle is the need to ensure an equivalent, or higher, protection level.

1. Introduction

There is a pressing need to better assess and manage the risks of chemicals, to enable a sustainable progress towards the use of less hazardous chemicals (EEA, 2023). However, a number of challenges need to be overcome.

A major challenge to the chemical industry is the scale of the assessment exercise. The ECHA (2019) has estimated that robust information is available for 5% of the chemicals on the market, and another 20% have very limited information available. This leaves 75% of the chemicals on the EU market not assessed for safety, albeit uncertain, is due to the fact that many are not subject to any legal activity.

The Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) regulation (EU, 2006) is aimed at managing the risks of chemicals by requiring companies to generate information

on the intrinsic properties of chemicals that are manufactured in, or imported into, the EU. This information is used to classify chemicals on the basis of their hazardous properties by means of the Classification, Labelling and Packaging (CLP) regulation (EU, 2008), which in itself does not include any information requirements, but implements, in the EU, the classification criteria for hazardous chemicals of the United Nations Globally Harmonised System (UN, 2021). REACH and CLP are complemented by sectorial legislation dealing with chemicals in products, waste and environmental media. Under REACH, information requirements are proportionate to marketed tonnage levels. No information is requested below 1 tonne per year, and the information required in the 1–10 tonnes band is sufficient neither for a Chemical Safety Assessment nor for classification under CLP. At the time of writing, around 14,000 unique substances are subject to REACH (ECHA, 2023), while smaller numbers of chemicals are covered by sectorial legislation, such as plant protection products, biocides and cosmetics. In other words, the body of EU chemicals legislation, in spite of its complexity including more than 40 legal acts (EC, 2019), is not designed to address all of the chemicals on the EU market.

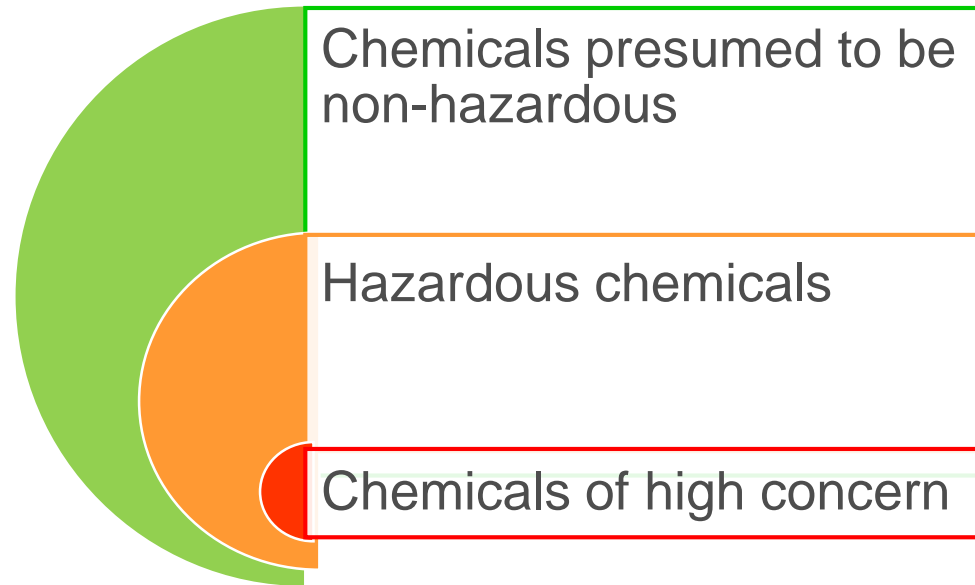
uropa.eu (A.P. Worth).

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Revised form 3 June 2023; Accepted 8 June 2023

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PRINCIPLE OF EQUIVALENT PROTECTION:

MAKE THE SAME DECISIONS, NOT NECESSARILY THE SAME PREDICTIONS



Innovate
Use without restriction



Restrict via concentration limits
Demonstrate safe use



Ban for some or all uses

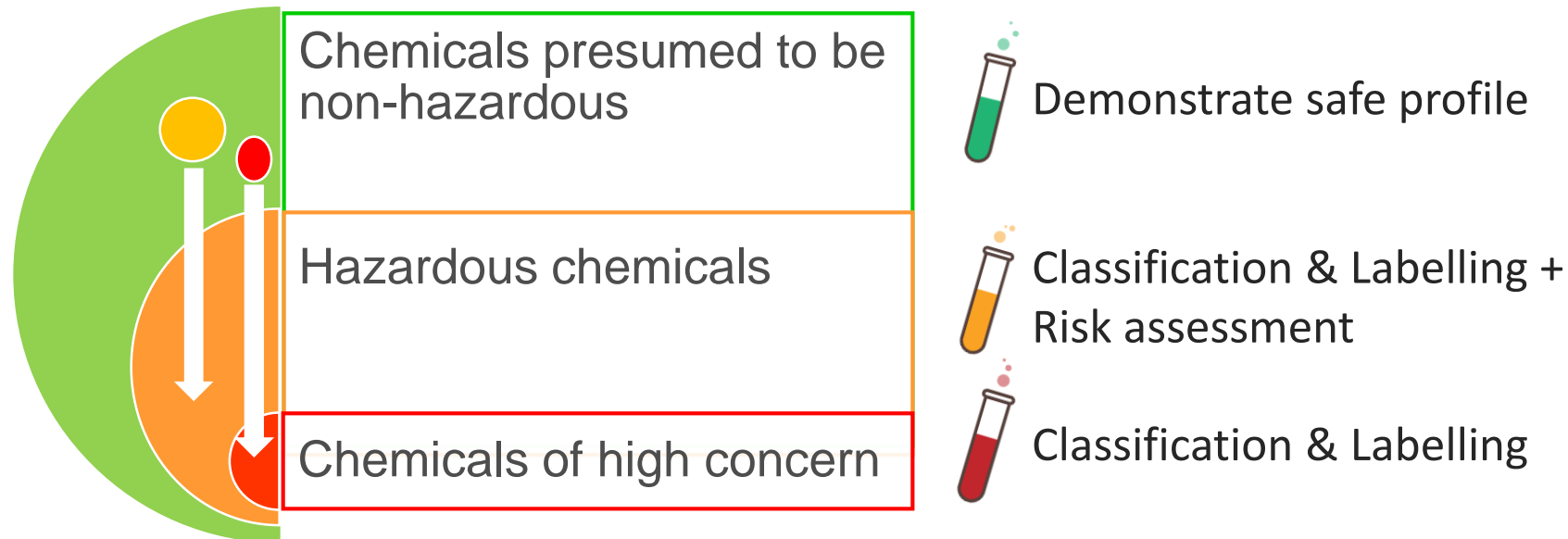
DEVELOPING A NEW CLASSIFICATION SCHEME

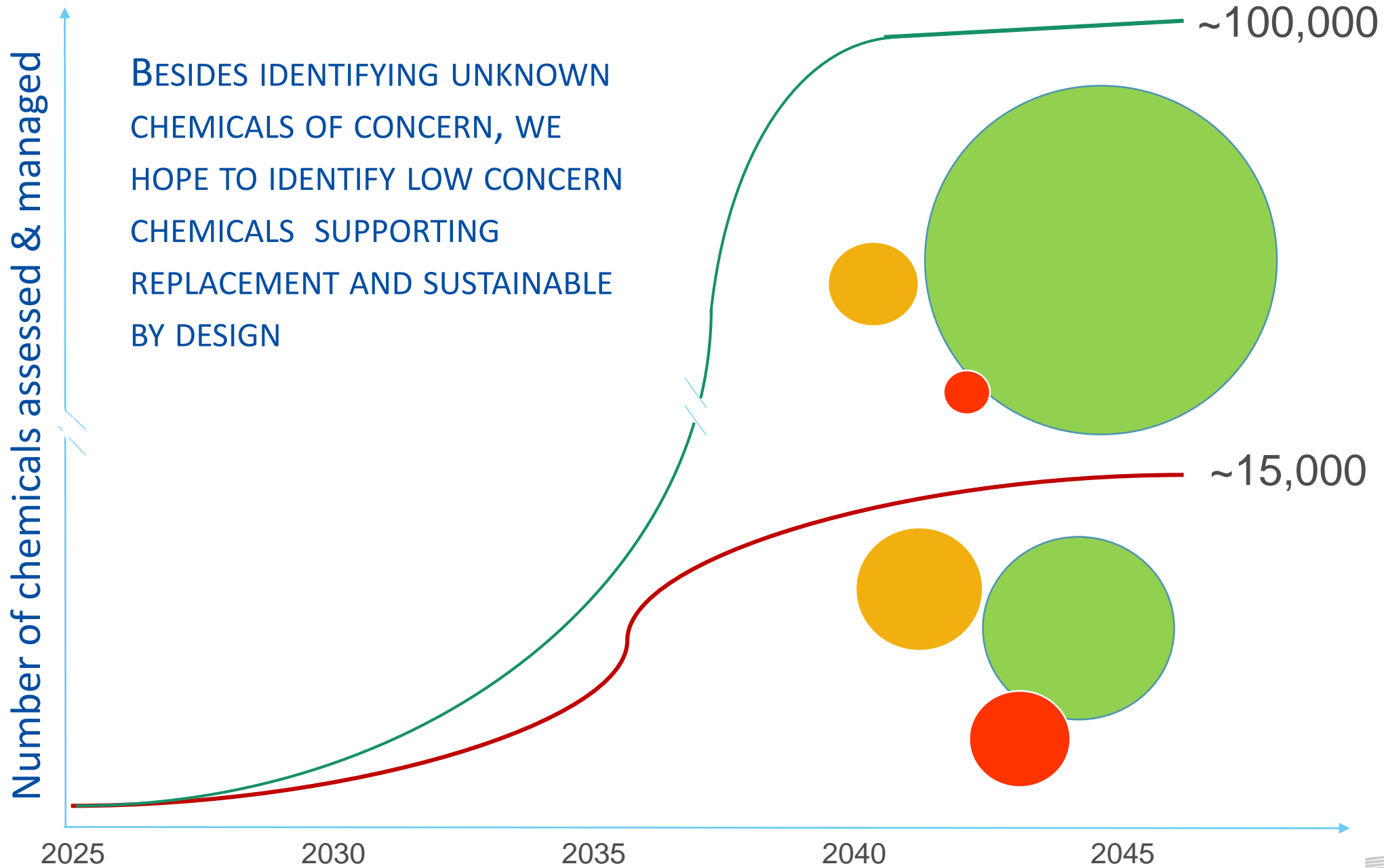
- Assign chemicals to groups 1-3 (**low**, **medium** & **high** concern)
- Existing data for already classified chemicals (**high** & **medium** concern) are used to calibrate the classification scheme resulting in **equivalent protection**

		Activity (NAM-based toxicodynamics)		
		High	Medium	Low
Potential Systemic Availability (NAM-based toxicokinetics, based on ADME properties)	High	H	H	M
	Medium	H	M	L
	Low	M	L	L

NAMs CAPTURE CHEMICALS CURRENTLY TREATED AS GREEN, BUT BASED ON NO OR LIMITED INFORMATION

- Application of the new classification scheme to chemicals in the current low concern group will result in some additional classifications and thus an **overall higher level of protection**





2025

2030

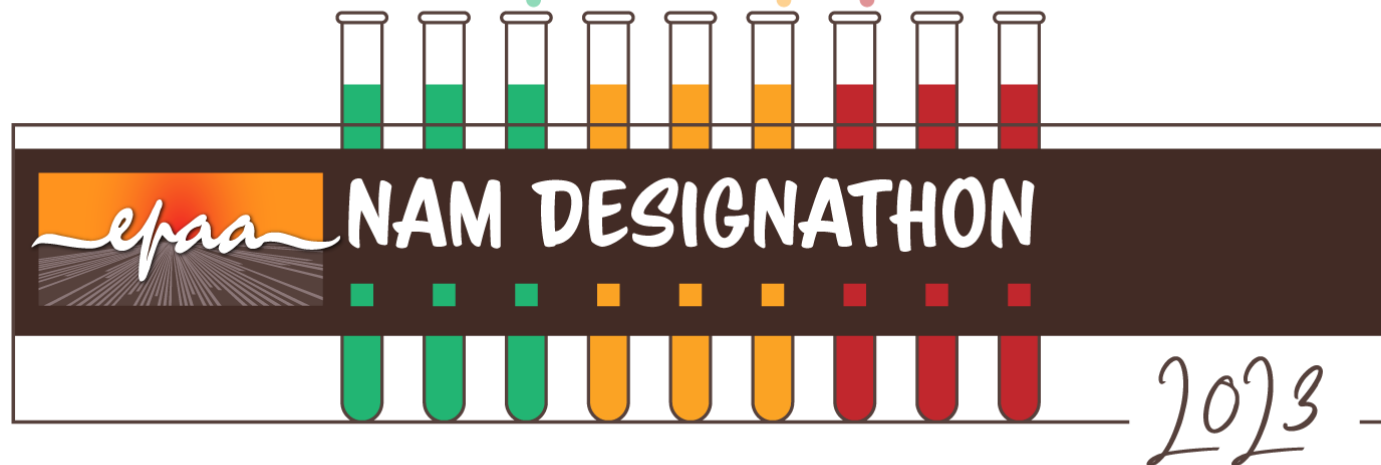
2035

2040

2045

~100,000

~15,000

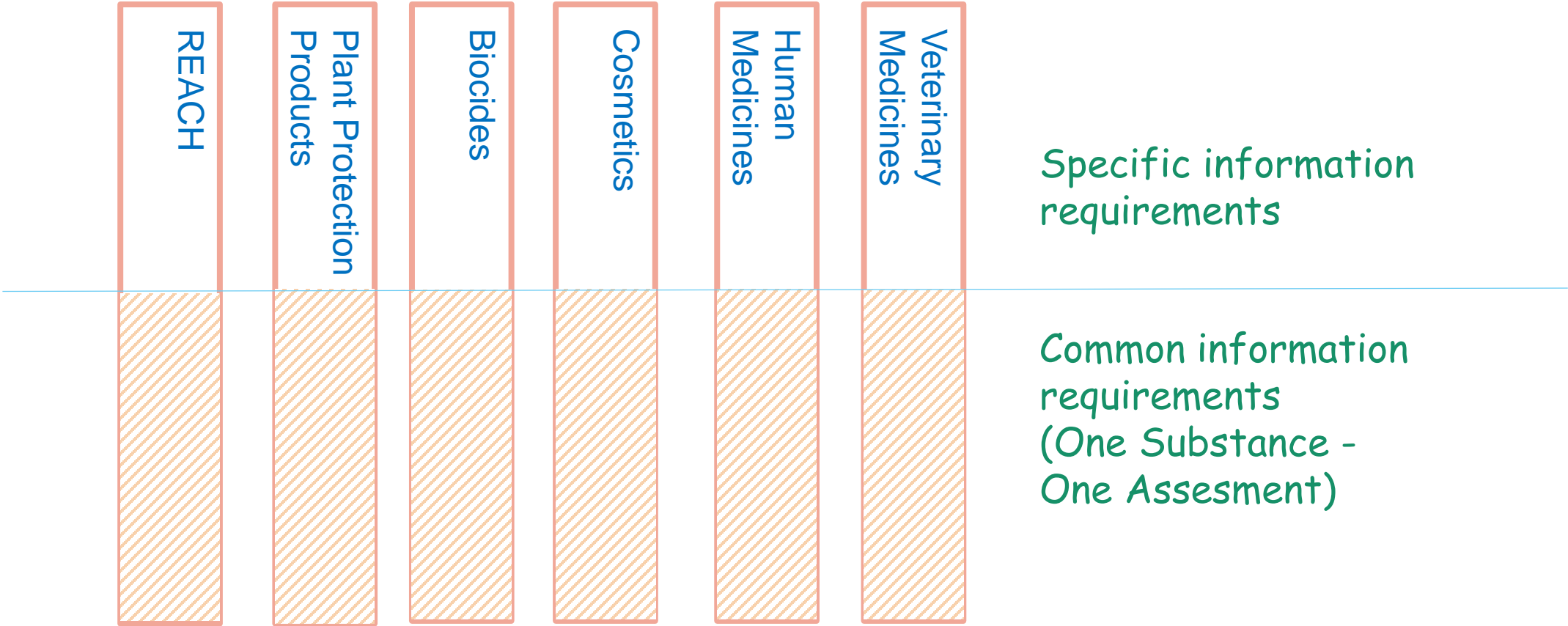


We received **23 NAM-based solutions** to inform the development of a future classification system for systemic toxicity of human health.

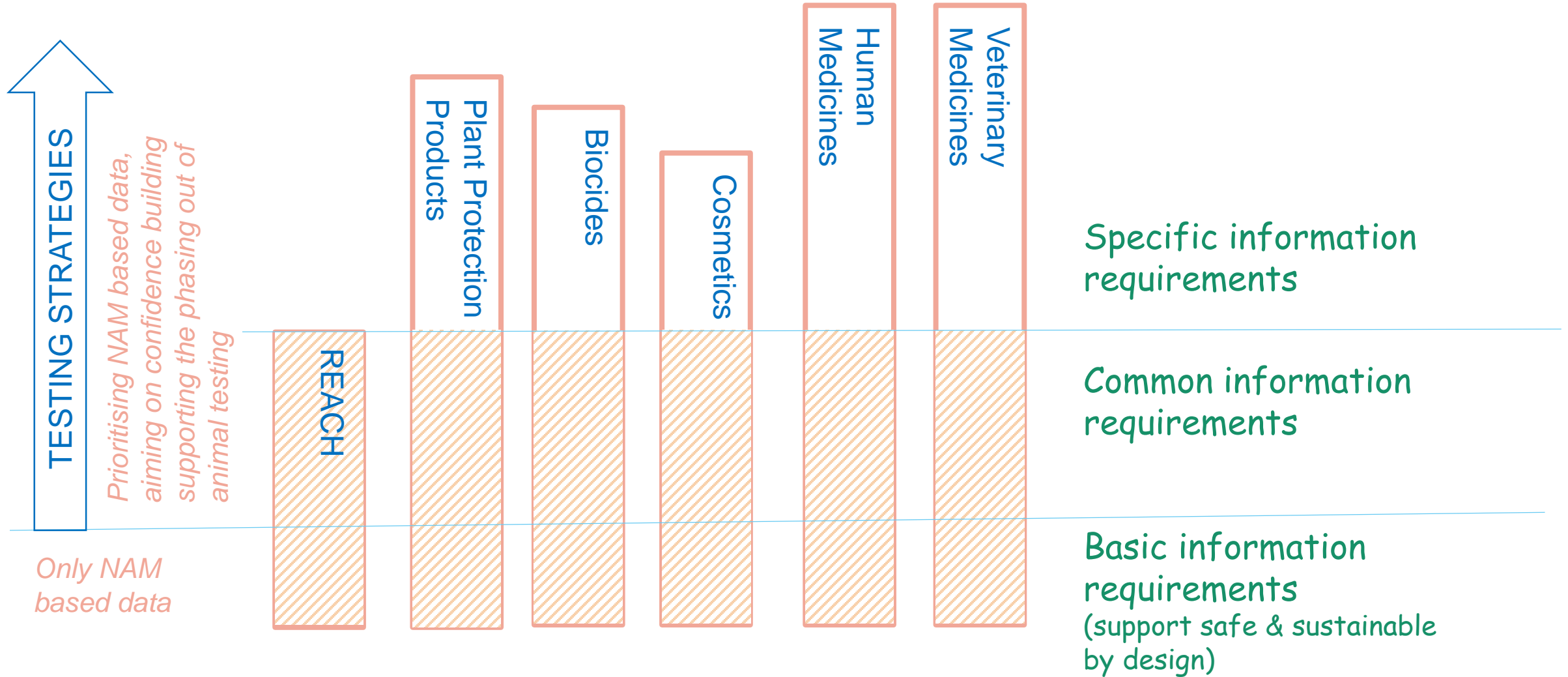
There will be no winning solution!

In March we meet with all contributors to compare and contrast the different solutions and co-create!

Information Requirements for Systemic Health Effects



Information Requirements for Systemic Health Effects



Business, Economy, Euro


Internal Market, Industry, Entrepreneurship and SMEs

[Home](#) | [Single market and standards](#) | [Industry](#) | [Entrepreneurship and SMEs](#) | [Access to finance](#) | [Sectors](#) | [Tools and databases](#)[Home](#) > [Events](#) > [The Commission roadmap for phasing out animal testing in chemical safety assessments](#)

TRAINING AND WORKSHOPS


The Commission roadmap for phasing out animal testing in chemical safety assessments

This hybrid workshop was organised in Brussels as part of the Commission's response to the European Citizens' Initiative (ECI) 'Save Cruelty-free Cosmetics - Commit to a Europe without Animal Testing'.

 **This event has ended.**Close 

The workshop consisted of 2 parts. The presentations delivered during these 2 days can be read [on our dedicated page](#). The recorded livestream is also available on our YouTube channel:

- [Day 1](#)
- [Day 2](#)

 [chemical industry](#) | [cosmetics industry](#) | [animal welfare](#) Monday 11 December 2023, 09:00 - Tuesday 12 December 2023, 17:30 (CET)

https://single-market-economy.ec.europa.eu/events/commission-roadmap-phasing-out-animal-testing-chemical-safety-assessments-2023-12-11_en

Thank you



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