



PFAS IN THE WASTE SECTOR

TO ANALYSE THE
IMPACT OF A
POTENTIAL BAN



WELCOME

Claudia Mensi FEAD President

Introduction and welcome





MATTIA PELLEGRINI

Head of Unit Waste, DG ENV European
Commission

Keynote speech of the
Commission's point of view on
the ECHA restriction proposal.





DR. CARLA A. DANNENBERG

**Scientific Officer, Federal Office for
Chemicals, BAuA, Germany**

Presentation of the PFAS
restriction proposal prepared
by authorities in Denmark,
Germany, the Netherlands,
Norway and Sweden and
submitted to ECHA



The Universal PFAS Restriction Proposal

FEAD conference on
PFAS in the waste sector to analyse
the impact of a potential ban

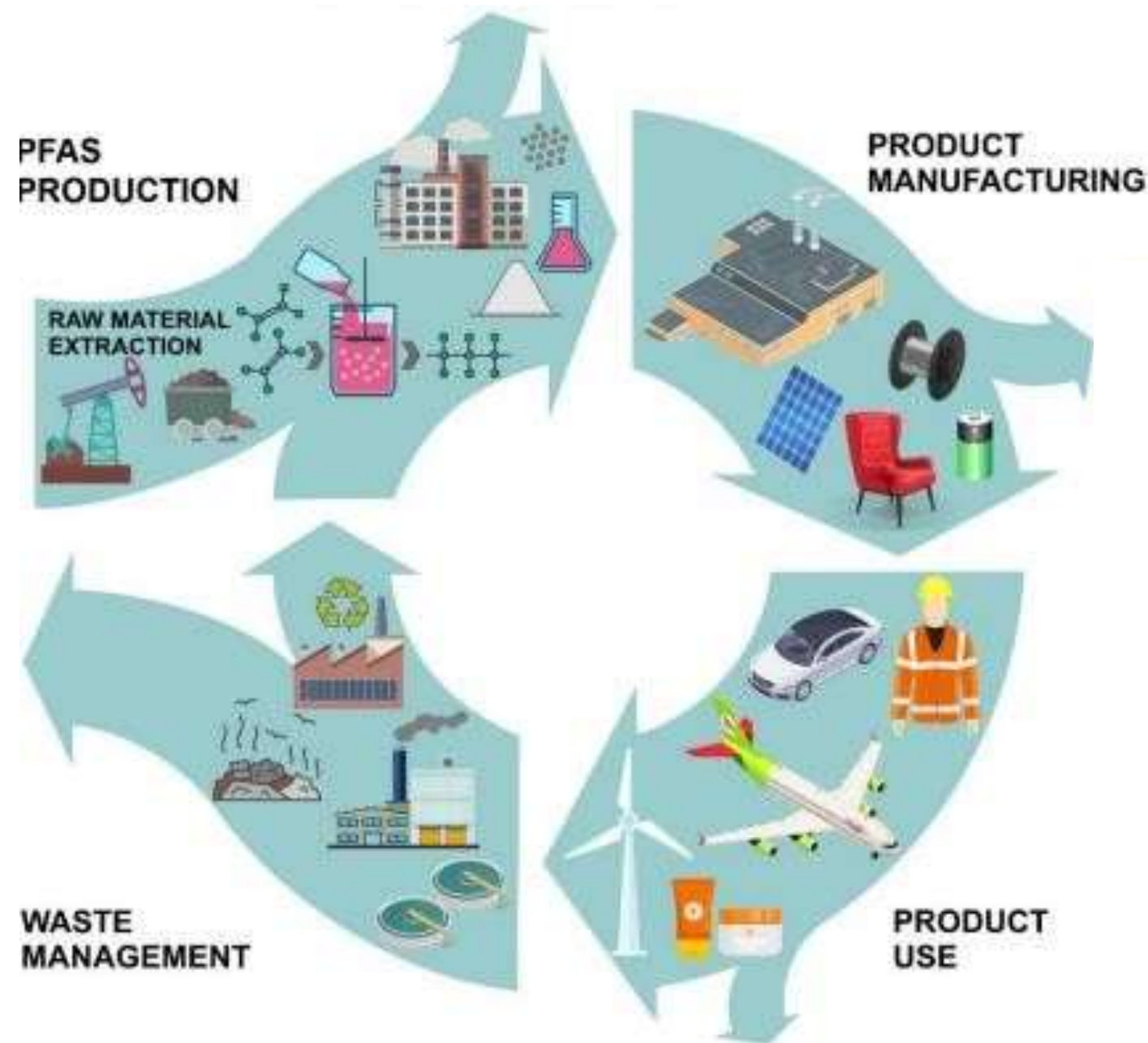
Dortmund/Rimini, 08 November 2023



PFAS emissions

75 000 tons of emissions in 2020

4.5 mio tons of emissions over 30 years

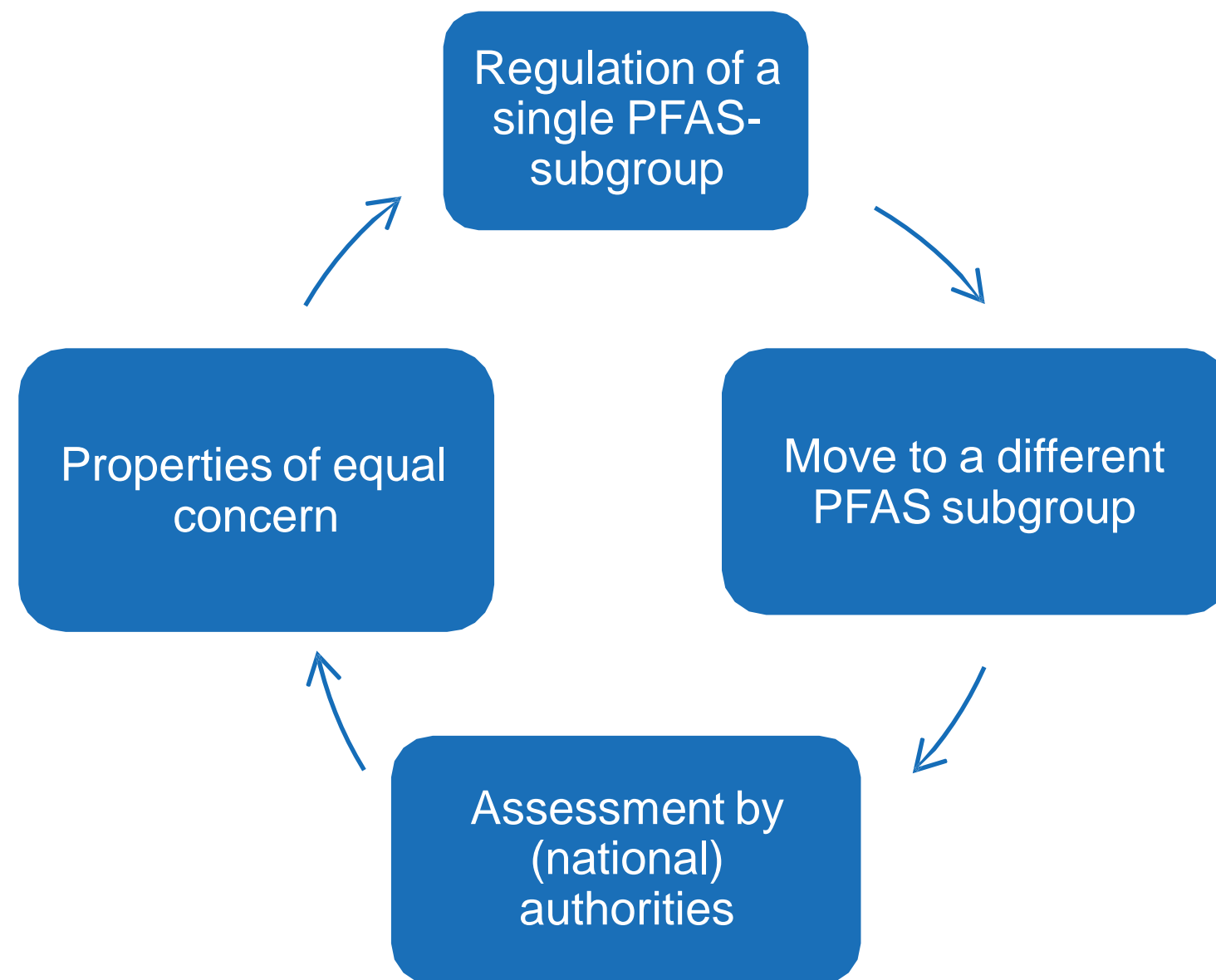


Source:

https://ec.europa.eu/environment/pdf/chemicals/2020/10/SWD_PFAS.pdf

„Regrettable Substitution“

- **Previous approach in regulations**



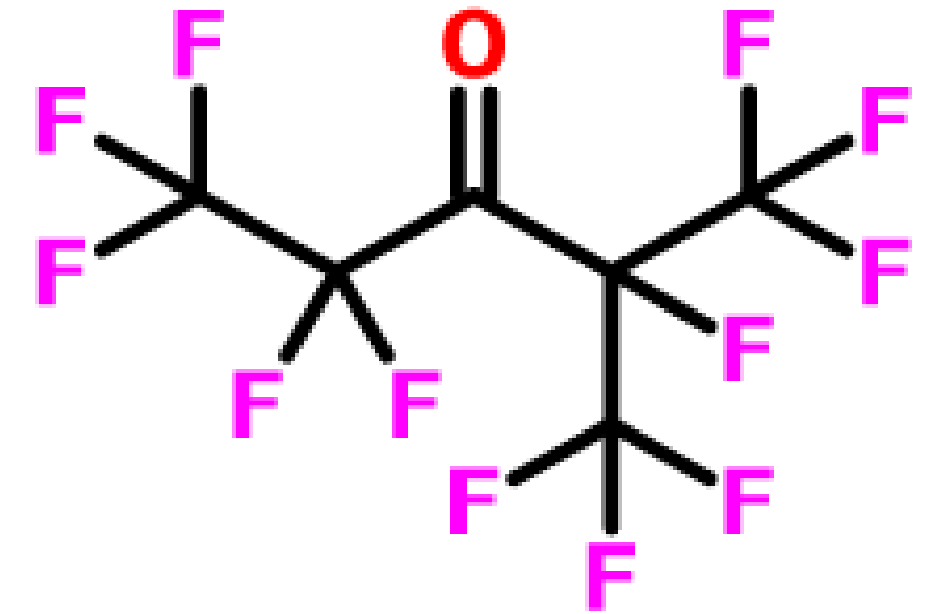
- Further emissions of PFAS over decades into the environment
- High overhead for authorities
- Uncertainty for stakeholders

Solution:

⇒ Regulation of all PFAS in one group

Grouping approach

- **Based on**
 - chemical structure
 - concern (persistence)
- **OECD definition (2021) as starting point**
 - Include only persistent PFASs and PFASs that degrade to persistent PFASs
- **Aim: Avoid regrettable substitution**



Chemical Scope

PFAS Definition (OECD (2021)):

Any substance that contains **at least one fully fluorinated methyl (CF₃-) or methylene (-CF₂-) carbon atom** (without any H/Cl/Br/I attached to it).

Exceptions:

A substance that only contains the following structural elements is **excluded from the scope** of the restriction: **CF₃-X or X-CF₂-X'**,

where X = -OR or -NRR' and X' = methyl (-CH₃), methylene (-CH₂-), an aromatic group, a carbonyl group (-C(O)-), -OR'', -SR'' or -NR''R'''; and where R/R'/R''/R''' is a hydrogen (-H), methyl (-CH₃), methylene (-CH₂-), an aromatic group or a carbonyl group (-C(O)-).

Includes persistent PFASs and their precursors
Includes polymeric PFASs

Restriction proposal (§ 1 and 2)



Manufacture, use and placing on the market

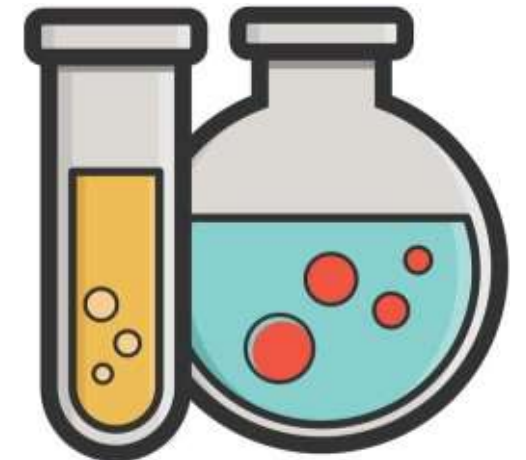
- as substances on their own

Placing on the market

- as **constituent in**
 - Substances
 - Mixtures
 - Articles
- Above certain concentration levels

Concentration limits (§ 1 and 2)

- **25 ppb for individual PFASs**
- **250 ppb for the sum of individual PFASs**
 - Measurement of specific PFASs with targeted analysis
 - Methods available for ca. 40 - 50 PFASs (more under development)
 - Concentration limits similar to already existing PFAS restrictions
- **50 ppm for PFASs (incl. polymeric PFAS)**
 - Total fluorine content
 - Fluorine content exceeding 50 ppm → possibility to provide proof for the fluorine measured as content of either PFASs or non-PFASs to enforcement authorities



Restriction Options assessed

RO1

Full ban of all uses

- Transition period: 18 months

RO2

Ban with use-specific derogations

- Transition period: 18 months
- Duration of derogation:
 - 5-years (based on set criteria relating to alternatives)
 - 12-years (based on set criteria relating to alternatives)
 - Time-unlimited derogations (specifically justified)

Transition period (§ 3)

Transition period: 18 months
„Standard“ period for REACH restrictions



**18 months after entry into force:
Ban of all uses unless explicitly derogated or below
concentration limits**



**(Continued) use of PFAS-containing mixtures and articles
already placed on the market still possible**

Active substances (§ 4)

- In biocidal products, plant protection products, medicinal products
- Specific EU-Regulations apply
 - Two-step approval-/authorisation scheme
 - Concerns related to PFASs (persistence) not fully addressed (exclusion criteria/candidates for substitution)
 - However, importance of other considerations next to risk assessment (efficacy, resistance management etc.)

⇒ Proposal: **time-unlimited derogation** from REACH restriction

⇒ Address PFAS concerns of AS within **specific regulations**

⇒ **Reporting requirement** to support action

Use-specific derogations (§ 5 and 6)

Derogations	All PFAS (§ 5)	FP & PFPE* (§ 6)
Proposed	(a) – (t)	(a) – (f)
[Potential]	(u) – (ee)	(g) – (o)

Proposed derogations

- Sufficient reliable evidence available to justify derogation

Example: Food contact materials for industrial and professional food and feed production

[Potential derogations]

- Weak evidence, not sufficient to fully justify derogation

Example: Non-stick coatings for industrial and professional bakeware

Re-consideration on basis of information obtained in **third party consultation**

*FP: Fluoropolymers
PFPE: Perfluoropolyether

Use-specific derogations (§ 5 and 6)

Column 1 Designation of the substance, of the group of substances or of the mixture	Column 2 Conditions of restriction	Column 1 Designation of the substance, of the group of substances or of the mixture	Column 2 Conditions of restriction
<p>proposed derogations Para 5 (a) – (t) Para 6 (a) – (f)</p>	<p>5. By way of derogation, paragraphs 1 and 2 shall not apply to:</p> <ul style="list-style-type: none"> a. polymerisation aids in the production of polymeric PFASs until 6.5 years after EIF. This derogation does not apply to the production of PTFE, PVDF and FKM. b. textiles used in personal protective equipment (PPE) intended to protect users against risks as specified in Regulation (EU) 2016/425, Annex I, Risk Category III (a) and (c), until 13.5 years after EiF; c. textiles used in personal protective equipment (PPE) in professional firefighting activities intended to protect users against risks as specified in Regulation (EU) 2016/425, Annex I, 	<p>potential derogations Para 5 (u) – (ee) Para 6 (g) – (o)</p>	<ul style="list-style-type: none"> dd. [use as refrigerants and for mobile air conditioning in vehicles in military applications until 13.5 years after EiF]; ee. [the semiconductor manufacturing process until 13.5 year after EiF]. <p>6. By way of derogation, paragraphs 1 and 2 shall not apply to <u>fluoropolymers and perfluoropolyethers</u> for the use in:</p> <ul style="list-style-type: none"> a. food contact materials for the purpose of industrial and professional food and feed production until 6.5 years after EiF; b. implantable medical devices (not including meshes, wound treatment products, tubes and catheters) until 13.5 years after EiF; c. tubes and catheters in medical devices until 13.5 years after EiF; d. coatings of Metered Dose Inhalers (MDIs) until 13.5 years after EiF; e. proton-exchange membrane (PEM) fuel cells



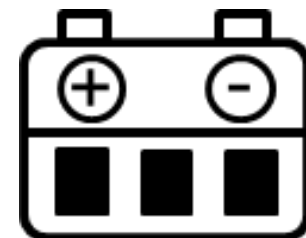
Proposed derogation times (§ 5 and 6)

Two derogation periods chosen for pragmatic reasons

6.5 years

- Alternatives identified but not available before entry into force
- Alternatives not yet available in sufficient quantities
- Alternative cannot be implemented before end of transition period

PEM fuel cells



13.5 years

- No feasible alternative identified yet
- Certification/authorization of alternative required and not possible within 6.5 years

Textiles for PPE



Reporting requirement / Management Plan (§ 7 and 8)

Reporting

- Active substances
- Applications of fluorinated gases
- Derogated uses with 13.5 years transition period
- Manufacturers, importers, formulators

Aim

- Obtain information on derogated uses and (amount of) PFASs used
- Ensure safe handling and disposal
- Support enforcement
- Support future review of restriction conditions

Management Plan

- FP and PFPE uses
- Manufacturers, importers, downstream users



Link to existing PFAS regulations (§ 9)

REACH Annex XVII:

C9-C14 PFCAs, salts and precursors
(Entry no. 68)
Polyfluorinated silanes (Entry no. 73)

POP Regulation:

PFOS, PFOA, PFHxS (salts and
precursors)

This restriction shall not affect these existing entries



Restriction for PFAS in FFF shall not be overruled
Other EU-Regulations (e.g. F-gas Regulation) apply in parallel and are seen as complimentary
Decision making on PFHxA still ongoing

Timeline



Consultation in scientific committees

Including 6 months + 60 days stakeholder consultation

22 March 2023
Start of
consultation

5 April 2023
Online information
session

25 September 2023
End of 6 months
consultation

2024
Opinion of
Committees

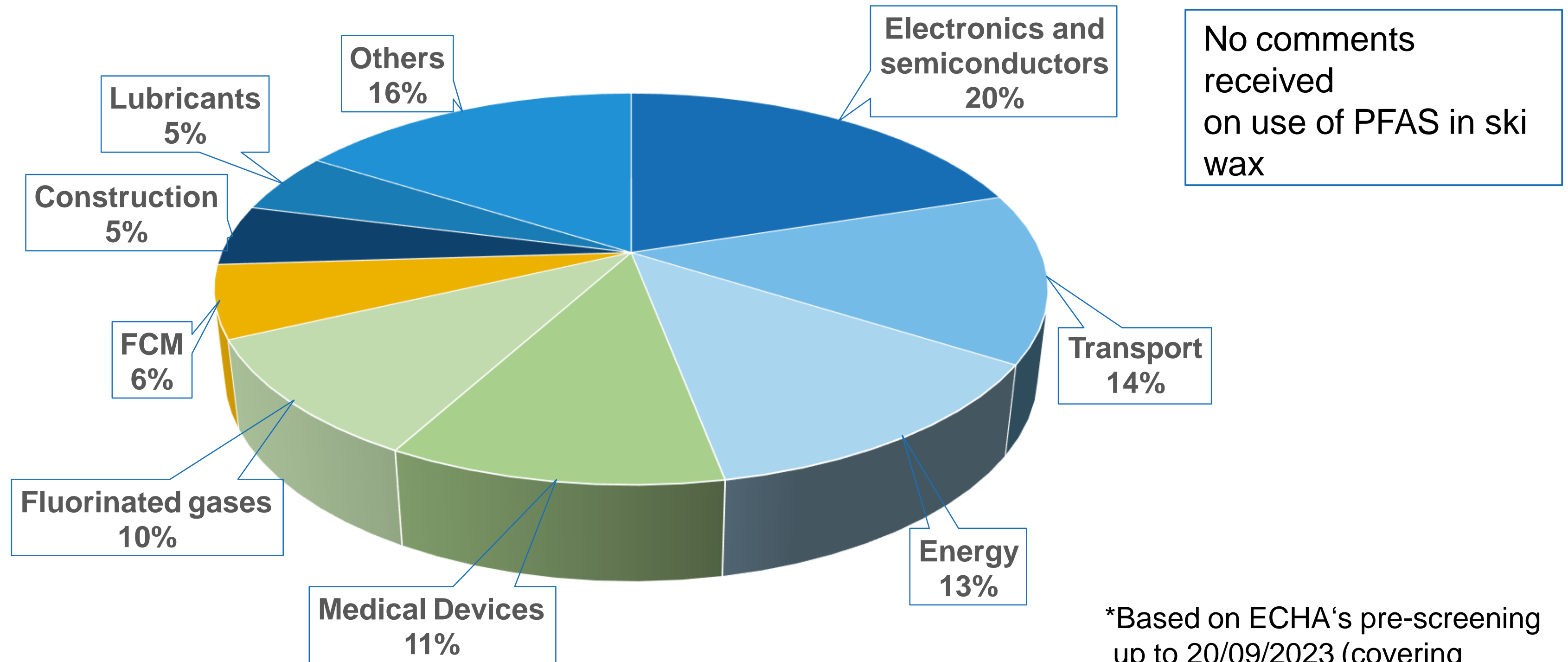
2025
COM decision
Entry into Force

2026/2027
Restriction becomes
effective

Current state of play

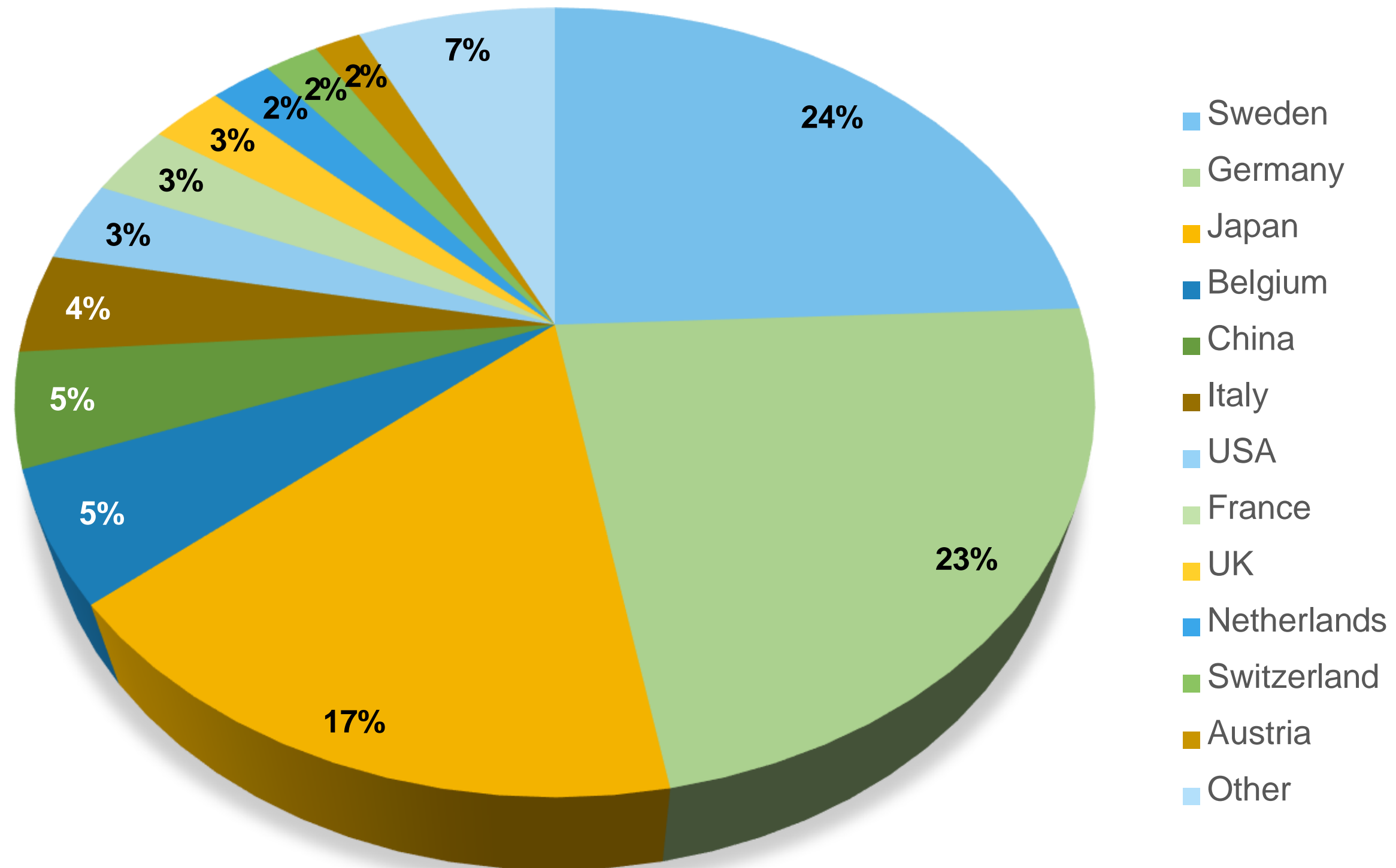
- **Public consultation ended on 25 September**
- More than 5 600 comments received from more than 4 400 organisations, companies and individuals
 - ca. 1 200 comments submitted by Swedish individuals in support of restriction
 - several MSCAs provided comments
- Some further statistics (cf next slides)

Distribution of comments*



*Based on ECHA's pre-screening up to 20/09/2023 (covering ca. 3 200 comments)

Geographical distribution



Based on data provided in ECHA news: <https://echa.europa.eu/-/echa-receives-5-600-comments-on-pfas-restriction-proposal>

Current state of Play

- **Discussion in RAC/SEAC ongoing**
 - Sector based approach
 - First sector: FCM
 - Next: Ski wax, consumer mixtures, cosmetics
 - Discussion on these sectors & hazard foreseen for Spring 2024
 - Committee workplan for 2024 to be discussed in December

Conclusions

- **Unacceptable risk related to the use of PFAS**
- **EU-wide restriction needed to minimise emissions**
- **Group approach (based on common concern persistence)**
 - Avoid regrettable substitution
- **Proposal currently under scrutiny by RAC and SEAC**
 - More than 5 600 comments to review and take into account
 - Sector based approach
- **DS team to consider comments from public consultation**

Questions?

Dr. Carl A. Dannenberg

Federal Institute for Occupational Safety and Health
Federal Office for Chemicals

E-mail: chemg@baua.bund.de

Phone: +49 231 9071 2013





QUESTIONS AND ANSWERS

The floor is yours to inquire, discuss, and learn.





PROFESSOR ALBERTO PIVATO

**Assistant Professor, University of
Padova**

A systematic critical review concerning the presence of PFAS in wastes and related implications on the current and proposed European regulatory framework

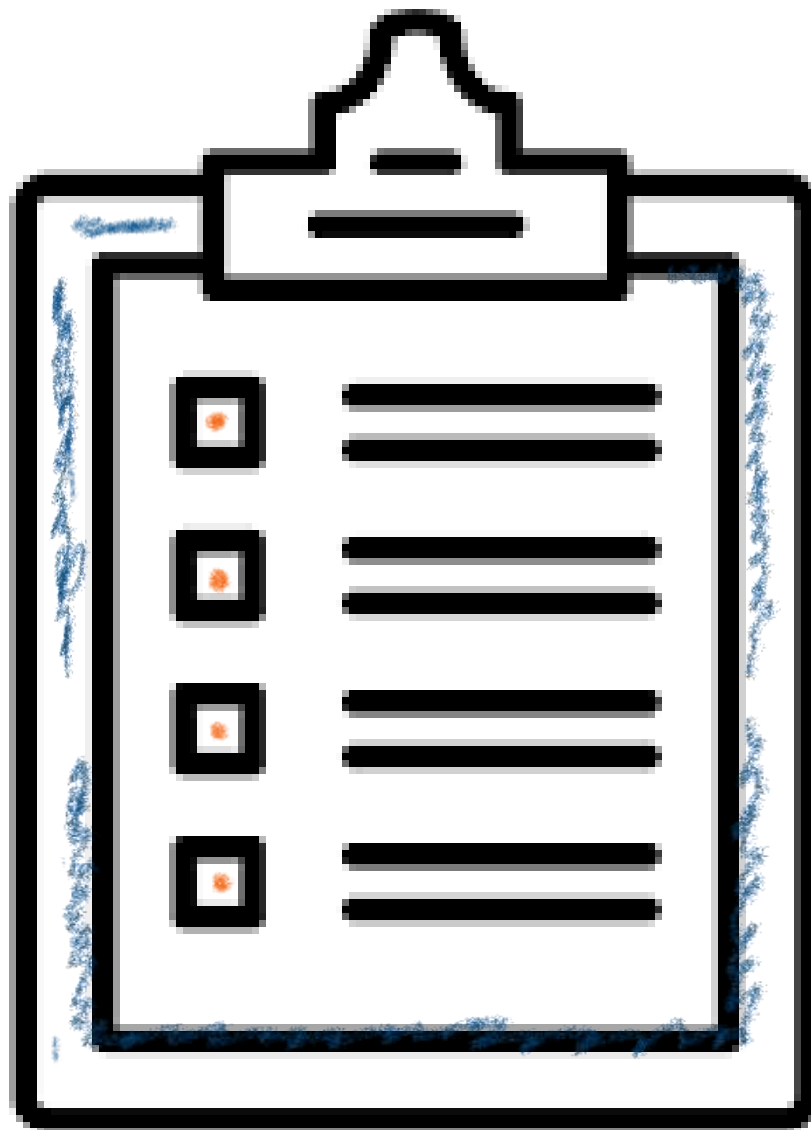


A SYSTEMATIC CRITICAL REVIEW CONCERNING THE PRESENCE OF PFAS IN WASTES AND RELATED IMPLICATIONS ON THE CURRENT AND PROPOSED EUROPEAN REGULATORY FRAMEWORK

A.PIVATO, G. BEGGIO. M.C. LAVAGNOLO

DICEA, Department of Civil, Environmental and Architectural Engineering, University of Padova, Via Marzolo 9, 35131 Padova, Italy

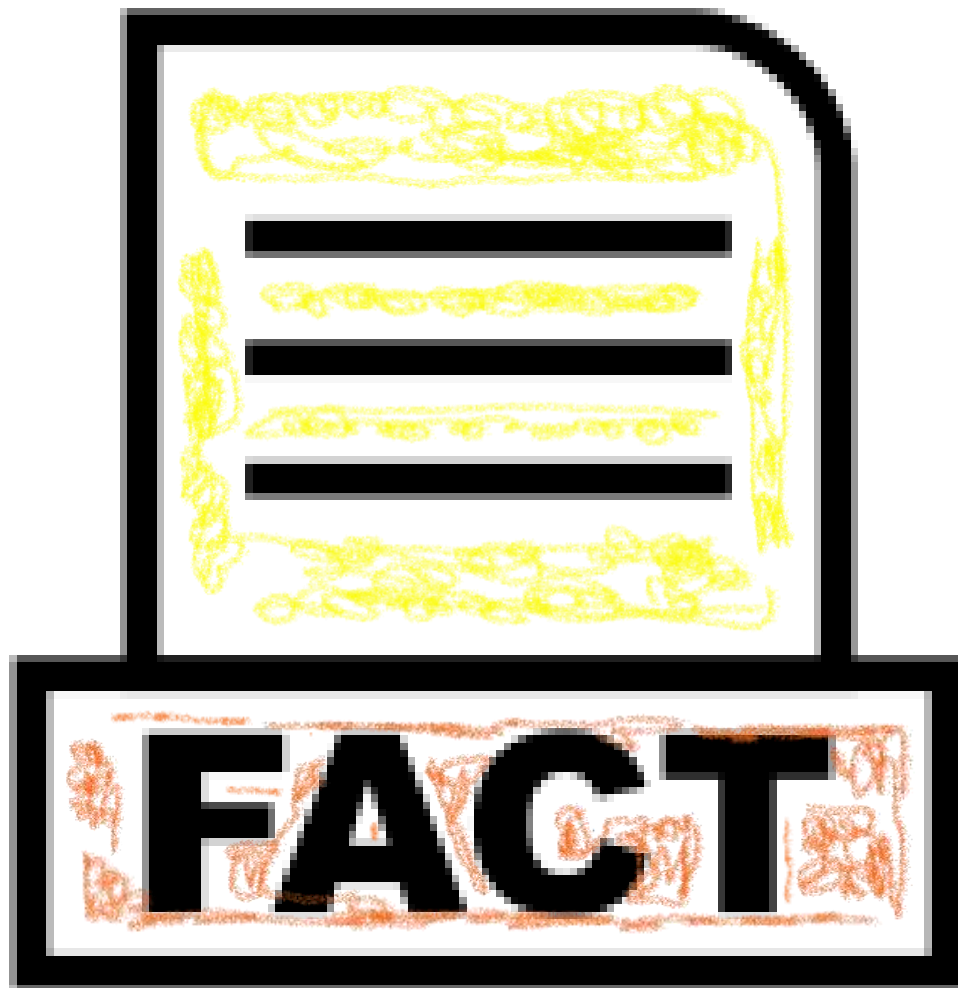


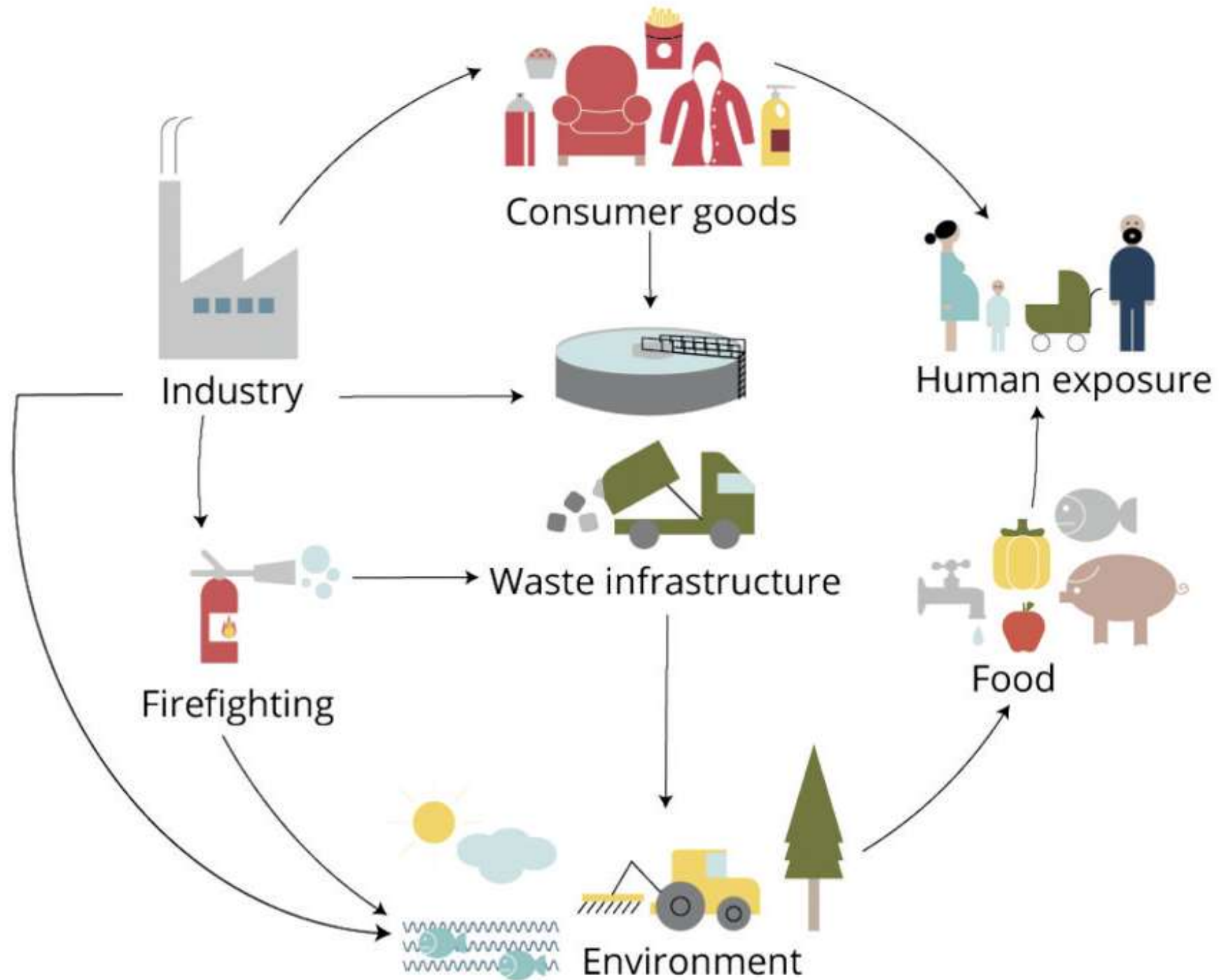


AGENDA

- The facts
- The questions: implication in waste management
- The regulation framework in the waste sector
- The methodological approach: the systematic critical review
- Results
- Further investigation
- Take home messages

The facts and the aim of the work



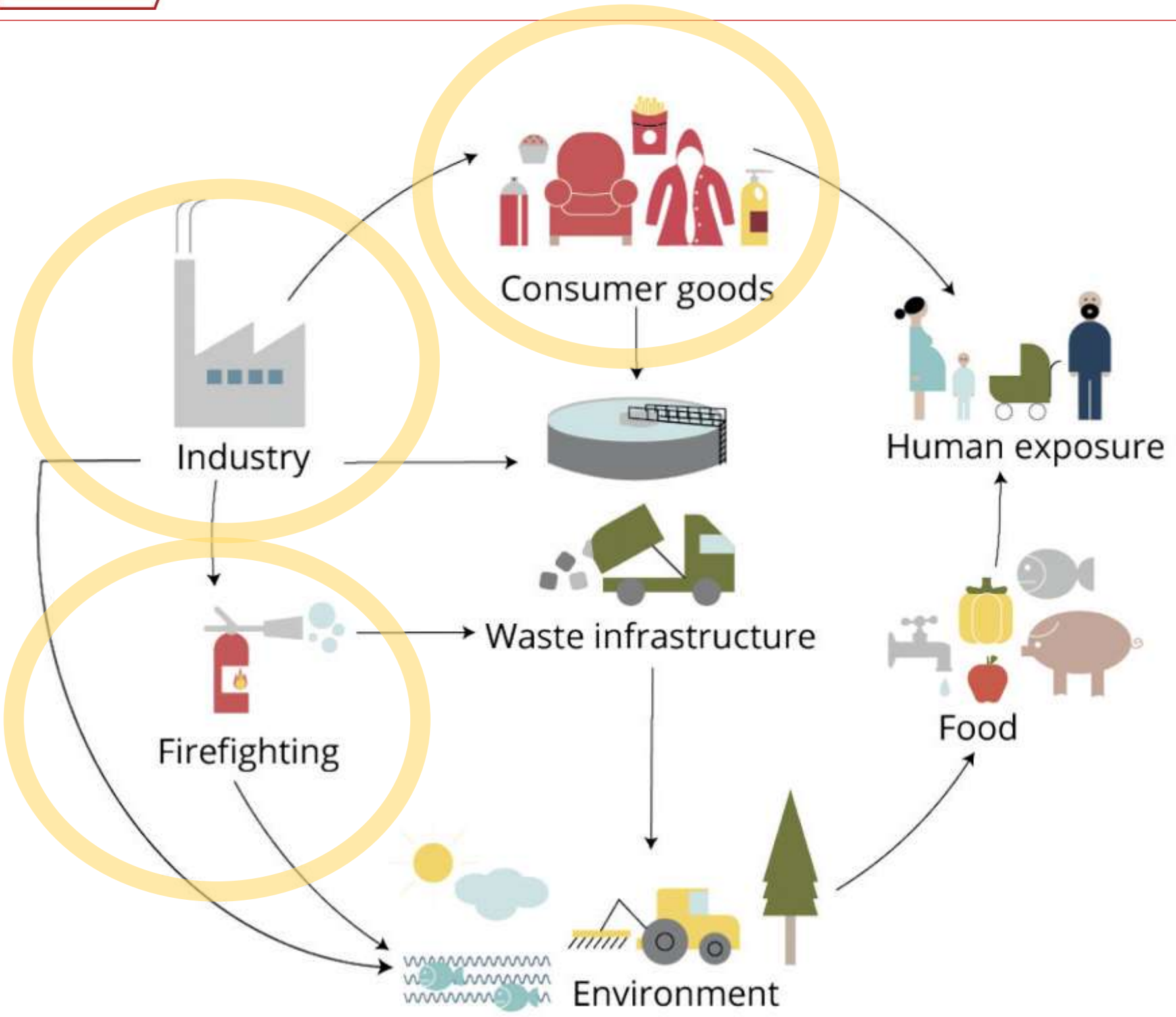


PFASs identify a class of chemicals whose

- **ubiquitous occurrence,**
- **hazards**
- **persistence, and**
- **bioaccumulation**

are well known nowadays.

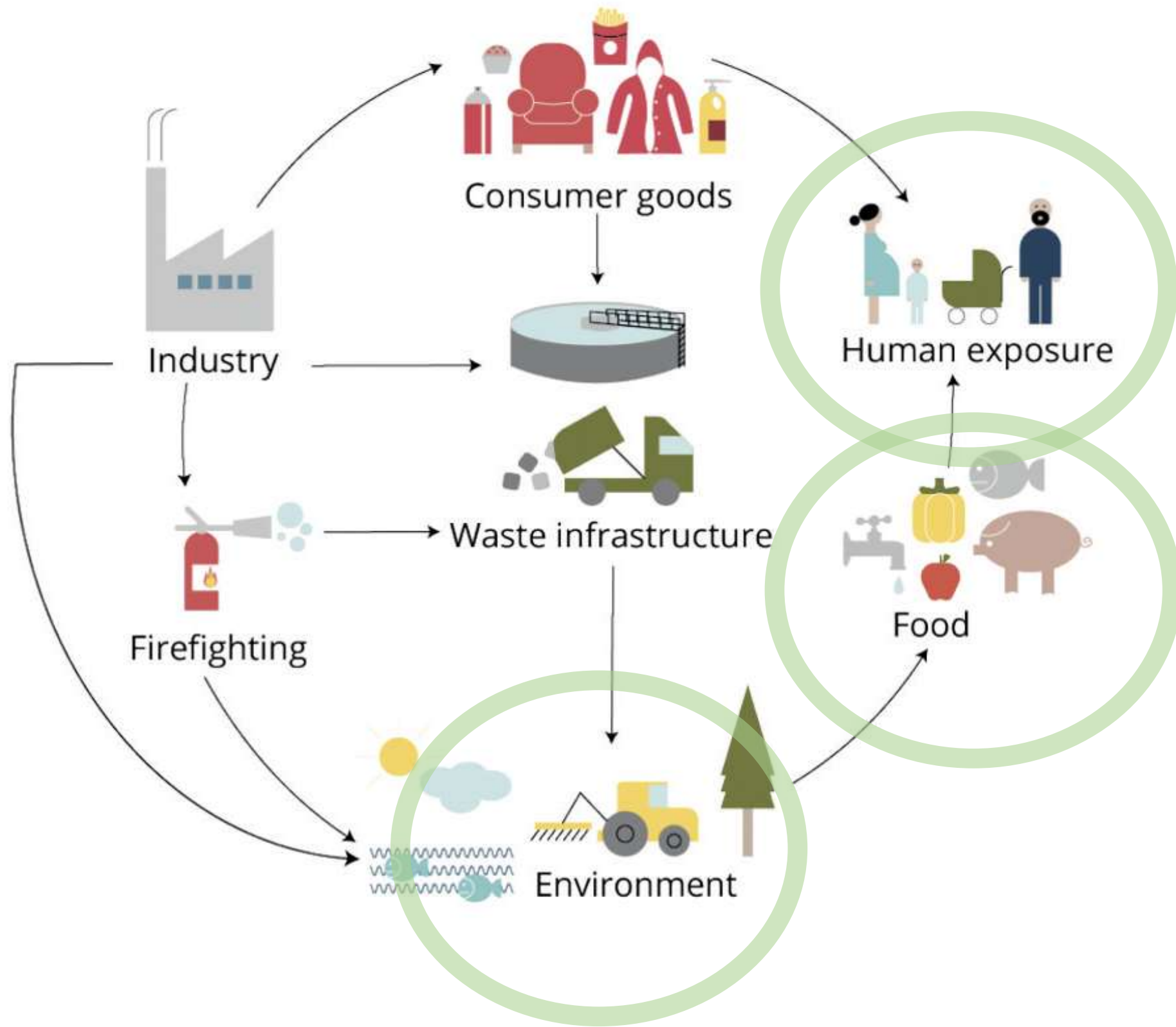
<https://www.eea.europa.eu/publications/emerging-chemical-risks-in-europe/emerging-chemical-risks-in-europe>



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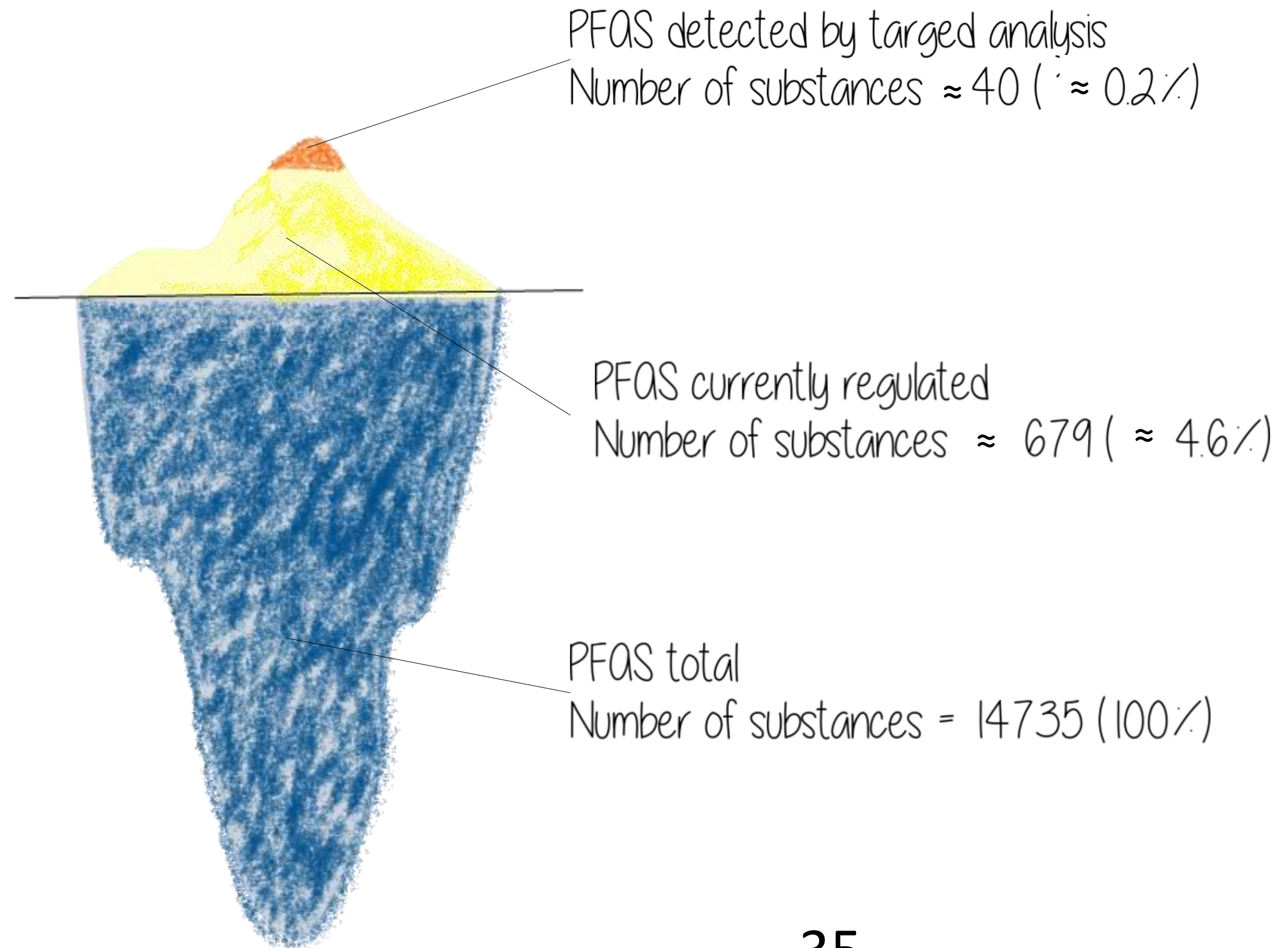
PFASs identify a class of chemicals whose

- **ubiquitous occurrence,**
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are well known nowadays.

According to OECD definition (2021), “Per- and polyfluoroalkyl substances” (PFASs) are defined as **fluorinated substances that contain at least one fully fluorinated methyl or methylene carbon atom (without any H/Cl/Br/I atom attached to it)**, i.e., with a few noted exceptions, any chemical with at least a perfluorinated methyl group ($-CF_3$) or a perfluorinated methylene group ($-CF_2-$) is a PFAS”. The “noted exceptions” refer to a carbon atom with a H/Cl/Br/I atom attached to it (Wang et al., 2021).

The “iceberg” knowledge of PFAS from a regulation perspective.



YES,

Regulations are continuously issued to ban or limit the use of PFAS in products



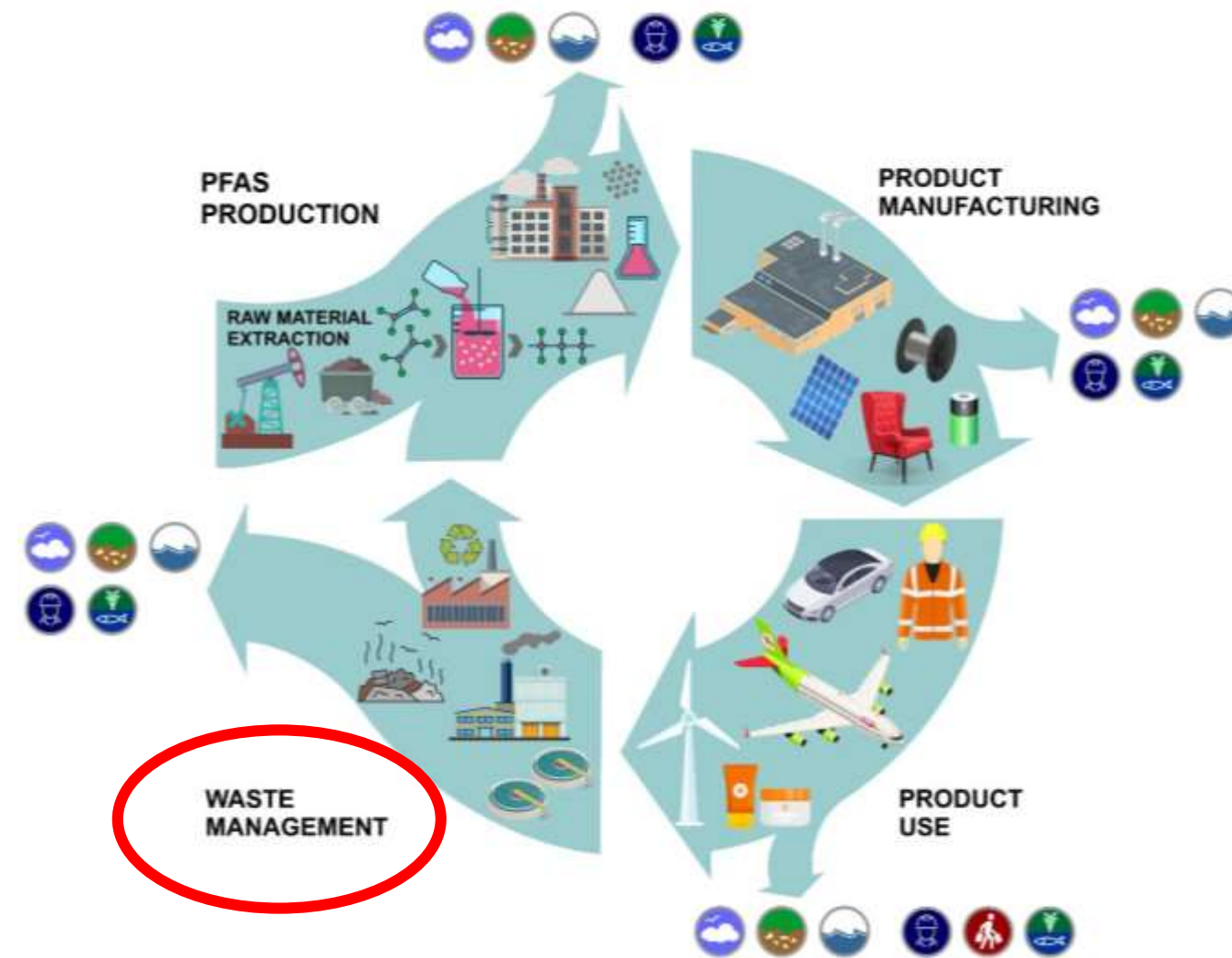
BAN PFAS*
FOREVER CHEMICALS

REQUIRE WARNING LABELS ON PFAS-LACED PRODUCTS.

*PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

BUT

The waste stage is part of the life cycle of a substance (in mixtures or in articles)



The implication of regulations on waste management is not well understood



There is another relevant aspect to consider: the presence of PFASs in the waste streams will remain for a long while; this is due to:

- nowadays it is **neither practical nor reasonable to ban** all uses of PFASs in one step, because some specific applications may serve a **critical role** for which alternatives currently do not exist;
- the **long-life cycle** of some products will determine the presence of PFASs in waste long after the time of placing on the market of those products;
- in some cases, such for **landfill mining**, waste disposed of can be newly considered for recovery;
- **leachates** from landfills can be contaminated by PFASs for a long period.

Research objectives



- to deepen the knowledge of the presence of PFASs in relevant waste streams for recycling issue,
- to understand how this could influence current and future waste management and recycling practises, considering continuous updates of the relative legal framework, paying particular attention to the proposed new provisions on their restriction in the REACH regulation (BAuA et al, 2023a)

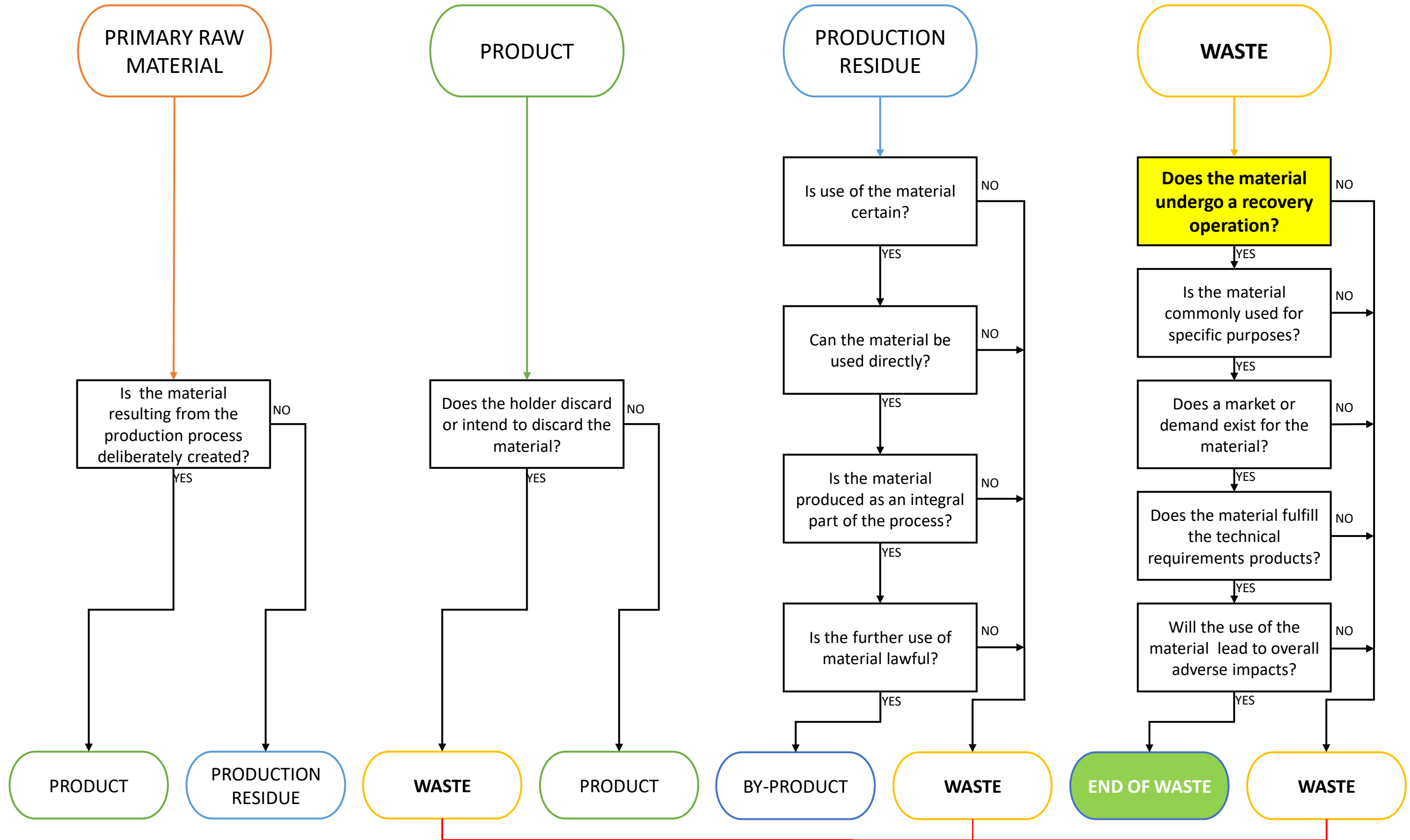


The regulation framework in the waste sector

INITIAL STATE of MATERIAL

PROCESSING USE DESTINATION

FINAL STATE of MATERIAL

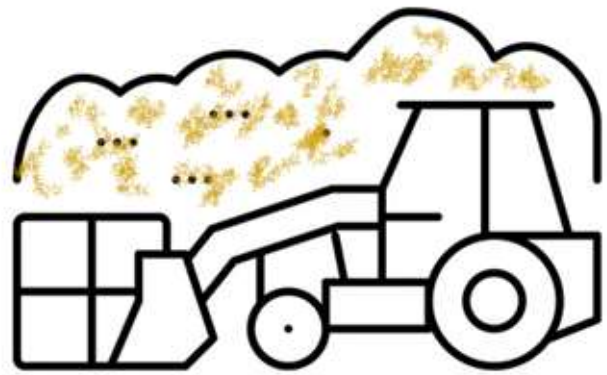


Hazardous Waste classification



Classification of waste

- EU Commission Decision 955 /2014
- EU Commission regulation 1357/2014
- 2017/997/EU



Recovery and disposal

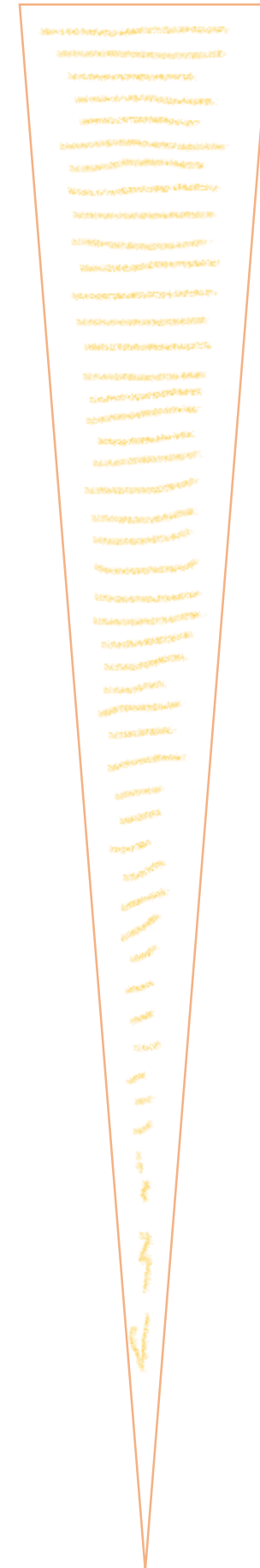
- Annex IV and V of Regulation (EU) 2019/1021
- Directive 1999/31/CE (Landfill)



End of waste

- Article 6 (1) and (2) of the Waste Framework Directive
- Reach Regulation
- Annex IV and V of Regulation (EU) 2019/1021
- POPs under the Stockholm Convention – Annex A and B

The concentration for the target chemical decreases



No direct provisions are set for PFASs

The current regulation states that wastes containing **only** the **first** POPs indicated in the former POPs regulation (Regulation (EC) No 850/2004) exceeding the listed concentration limits shall be classified as hazardous



Specific provisions are set only for PFOA, PFOS and PFHxS.

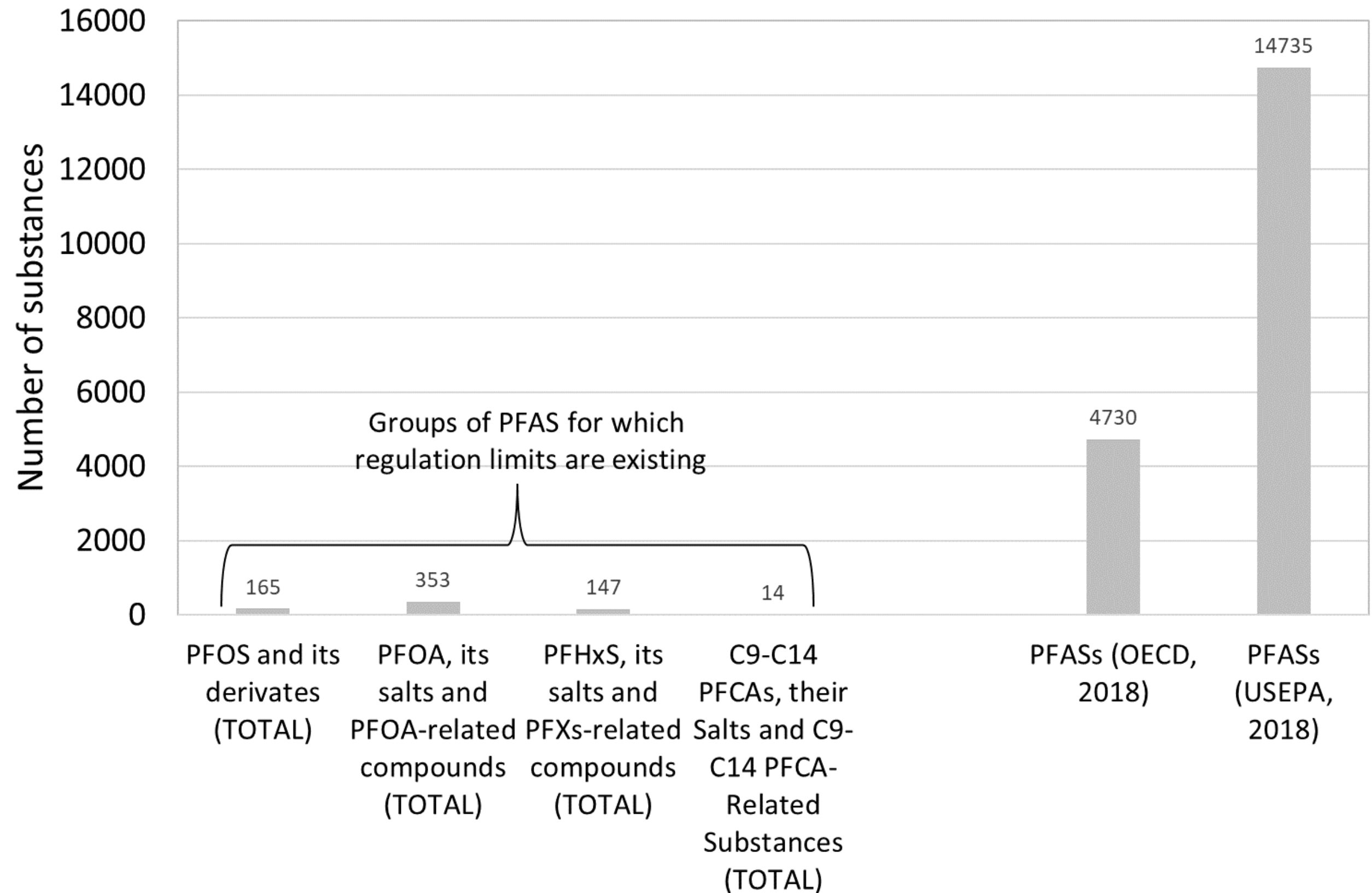


Restriction and elimination measures for production and use are currently set only for PFOA, PFOS, PFHxS and C9-C14 PFCAs .

Proposed measures are in discussion for PFHxA and PFASs (according to the definition of OECD, 2021)

Only a limited number of PFAS is currently regulated

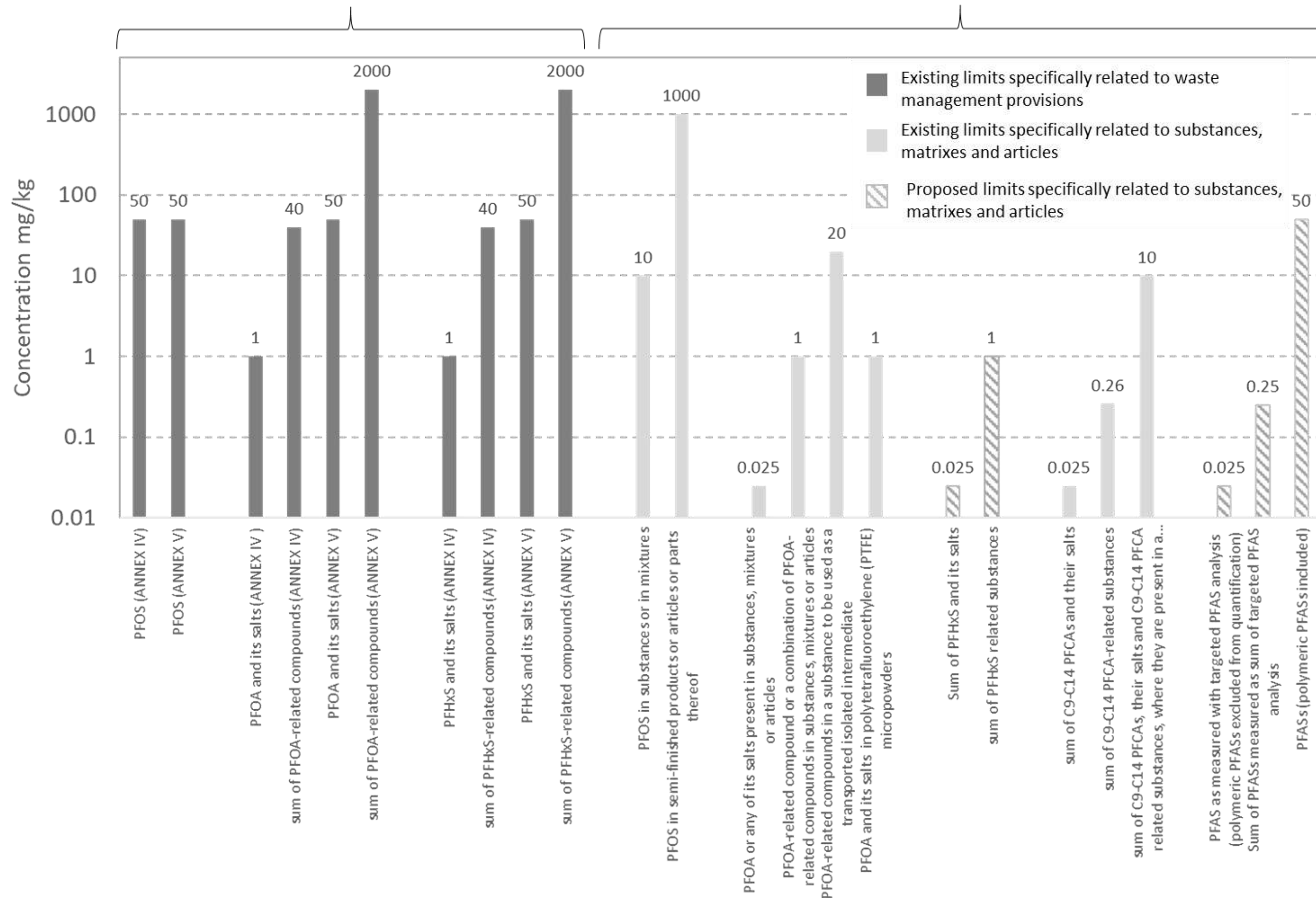
The meaning of the words «derivates», and «related compounds» as precursors is ambiguous



Graphical representation of limits on PFASs with implications on waste management

Limits with implications on: the disposal or recovery operations that may lead to recovery, recycling, reclamation or re-use of wastes; and potentially on the classification of waste

Limits and or/proposed limits with implications on the end-of waste procedure



BAUA et al, 2023a

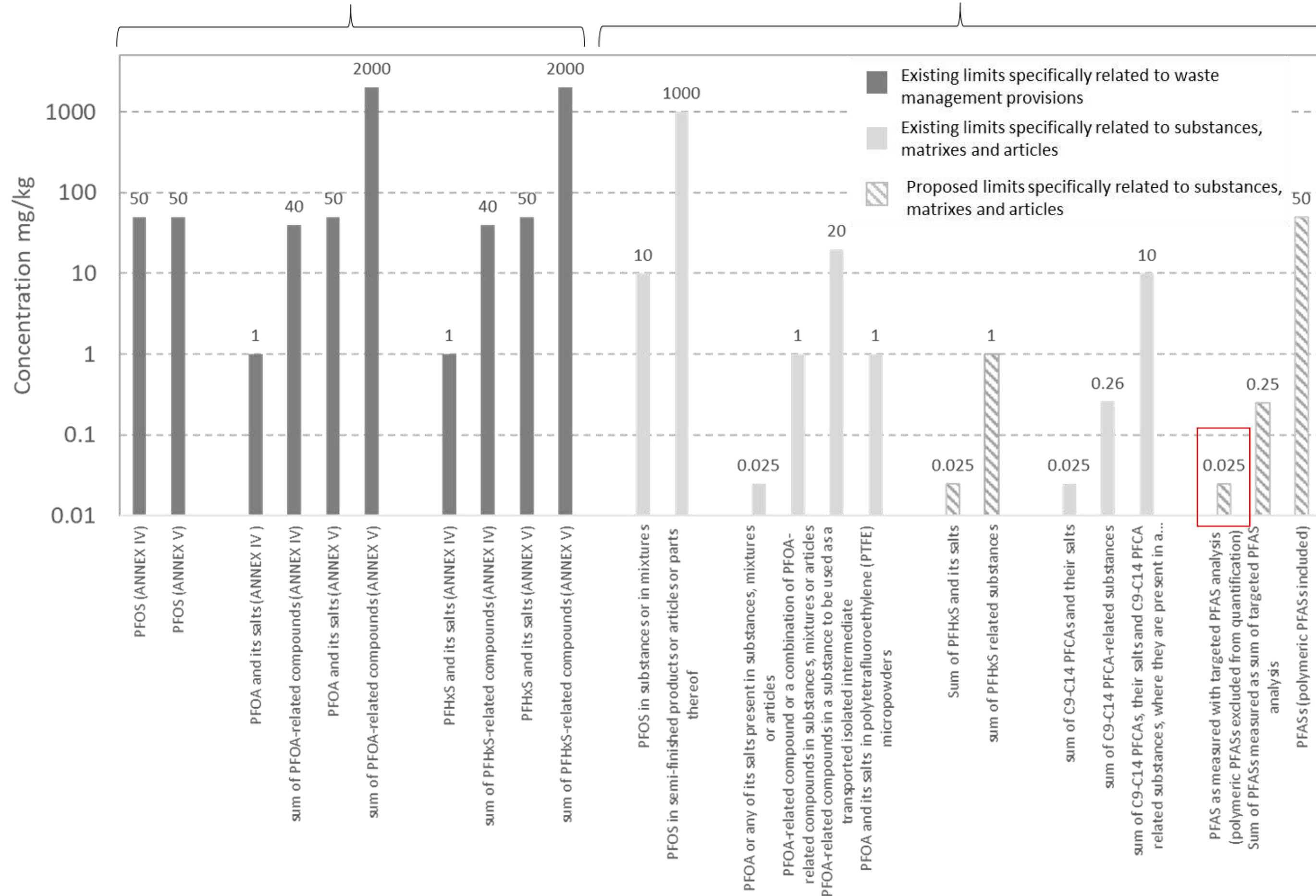
Column 1	Column 2
Designation of the substance, of the group of substances or of the mixture	Conditions of restriction
Per- and polyfluoroalkyl substances (PFASs) defined as: Any substance that contains at least one fully fluorinated methyl (CF ₃ -) or methylene (-CF ₂ -) carbon atom (without any H/Cl/Br/I attached to it). A substance that only contains the following structural elements is excluded from the scope of the restriction: CF ₃ -X or X-CF ₂ -X', where X = -OR or -NRR' and X' = methyl (-CH ₃), methylene (-CH ₂ -), an aromatic group, a carbonyl group (-C(O)-), -OR'', -SR'' or -NR''R'''	1. Shall not be manufactured, used or placed on the market as substances on their own; 2. Shall not be placed on the market in: a. another substance, as a constituent; b. a mixture, c. an article in a concentration of or above: i. <u>25 ppb for any PFAS as measured with targeted PFAS analysis</u> (polymeric PFASs excluded from quantification) ii. 250 ppb for the sum of PFASs measured as sum of targeted PFAS analysis, optionally with prior degradation of precursors (polymeric PFASs excluded from quantification) iii. 50 ppm for PFASs (polymeric PFASs included). If total fluorine exceeds 50 mg F/kg the manufacturer, importer or downstream user shall upon request provide to the enforcement authorities a proof for the fluorine measured as content of either PFASs or non-PFASs.

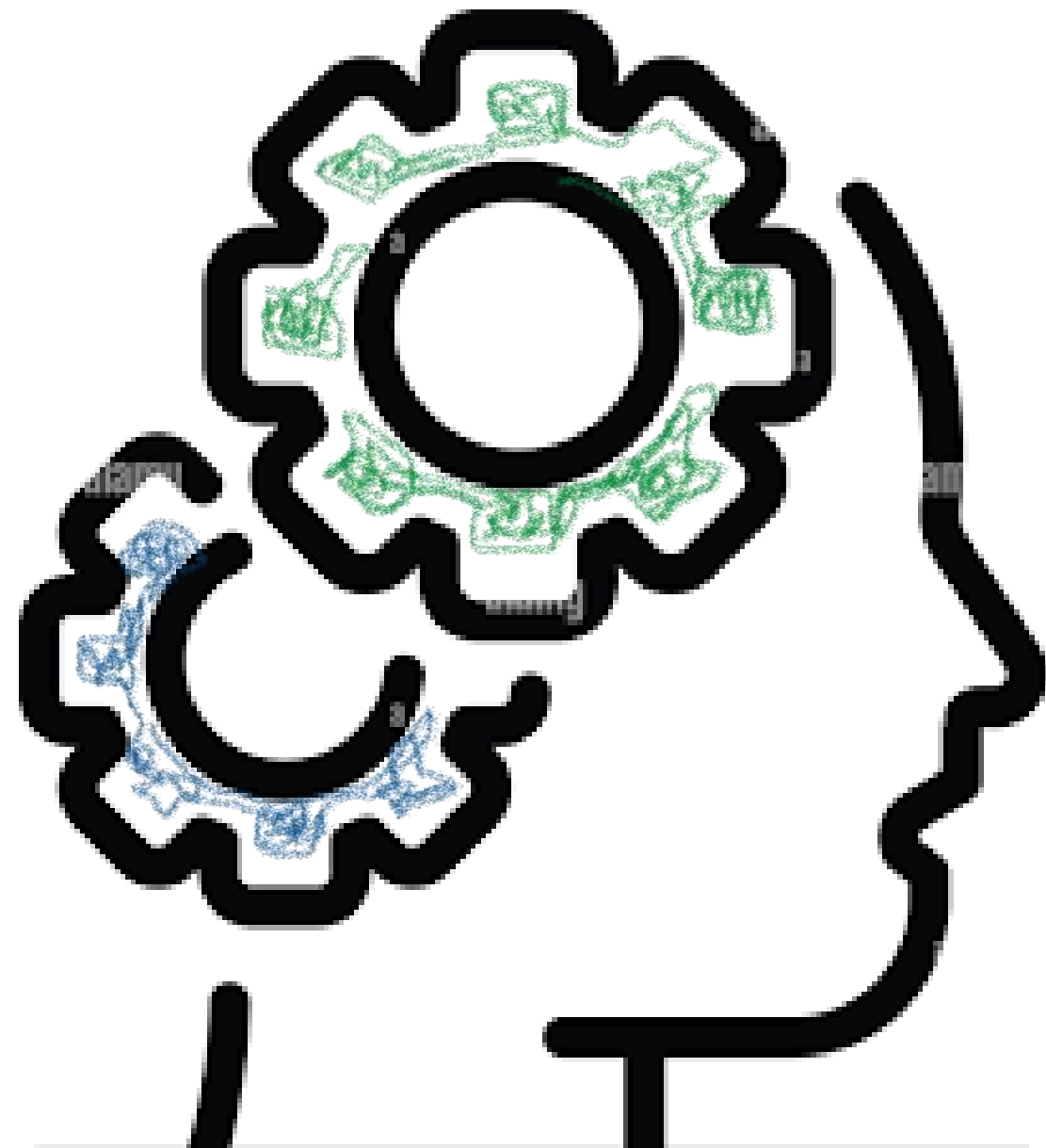
0.025 mg/kg = 25 ppb

FOR ANY PFAS as measured with target PFAS analysis

Limits with implications on: the disposal or recovery operations that may lead to recovery, recycling, reclamation or re-use of wastes; and potentially on the classification of waste

Limits and or/proposed limits with implications on the end-of waste procedure





The methodological approach: the systematic critical review

METHODOLOGY

- PRISMA Guidelines (Gurevitch et al., 2018; PRISMA, 2023)

DATABASES

- Scopus
- Web Of Science

CONSIDERED WASTE STREAMS

- Paper and cardboard
- Textile and leather
- Plastic
- Metal

TITLES, ABSTRACT, KEYWORDS

- "PERFLUOROALKYL*" OR "POLYFLUOROALKYL*" OR "PFAS"
- "PLASTIC*", "PAPER* WASTE*", "CARDBOARD", "CELLULOSIC WASTE", "METAL* WASTE*", "FERROUS WASTE*", "TEXTILE* WASTE", "LEATHER WASTE"

INCLUSION CRITERIA

- English-written scientific articles
- Articles from reviews on «products» (i.e., «waste to be»)

EXCLUSIONS IN SCREENING AND ELIGIBILITY

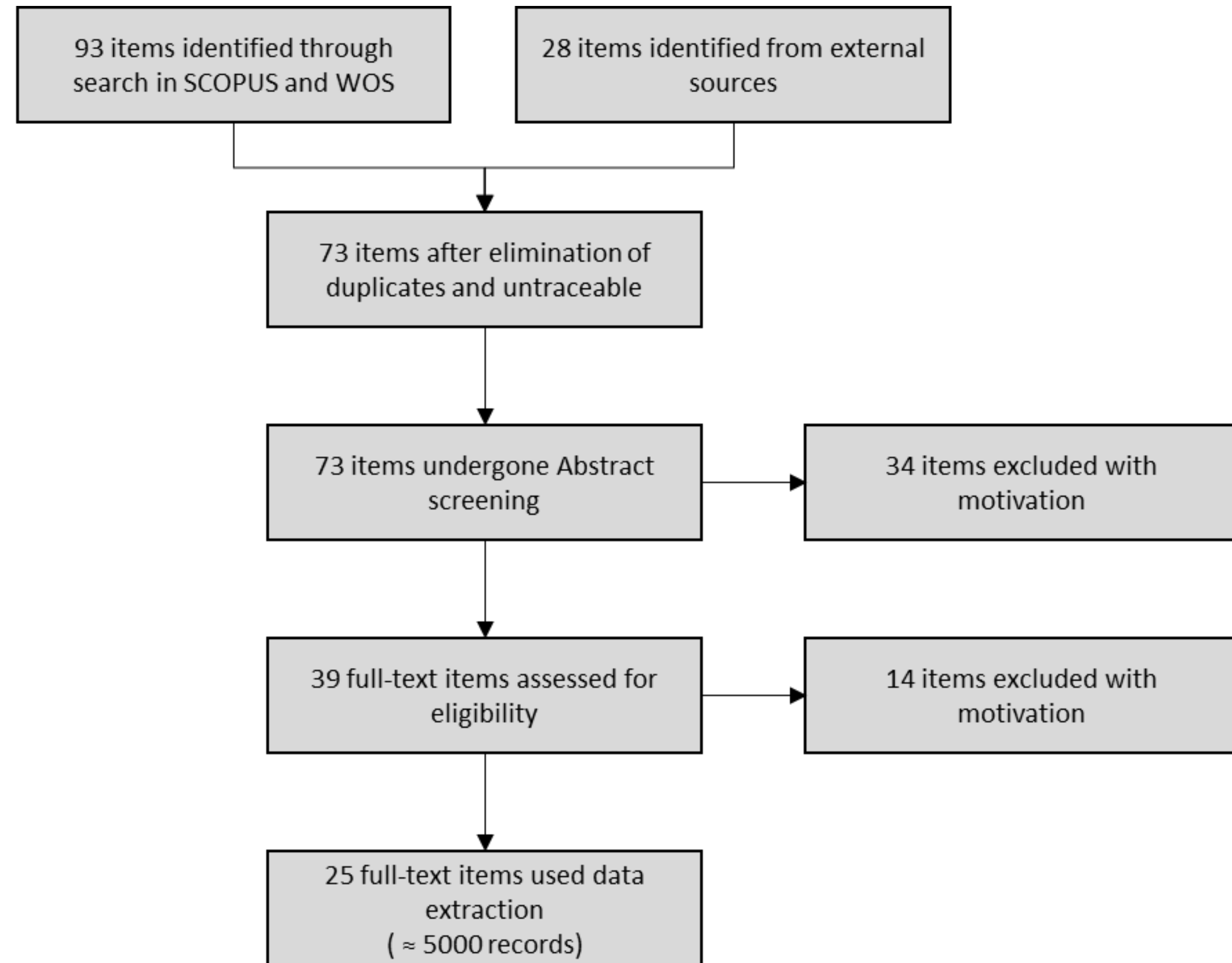
- qualitative studies
- out of scopes – landfill leachates, sewage sludges, etc.-

IDENTIFICATION

SCREENING

ELIGIBILITY

INCLUSION

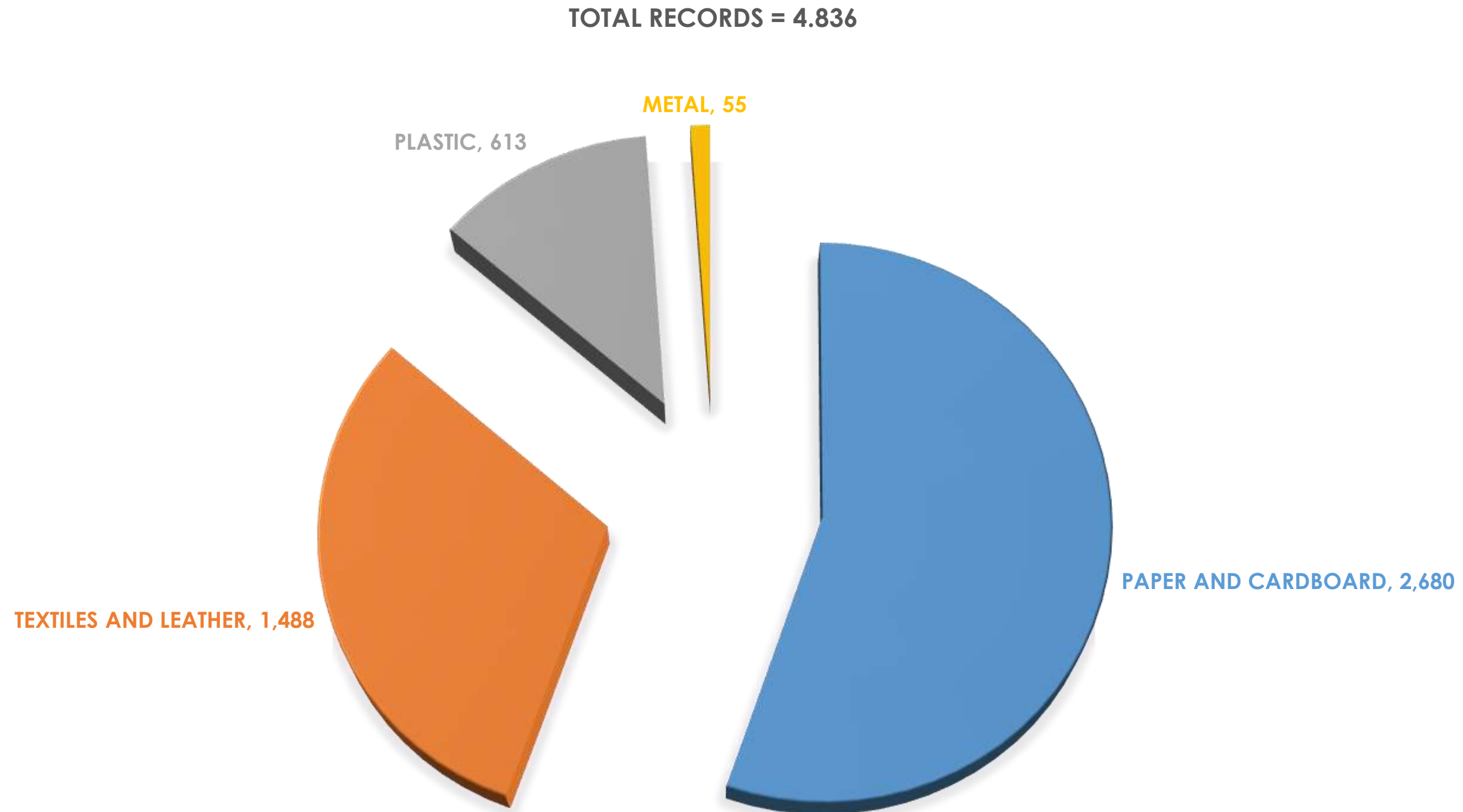


THE DATABASE

Reference	Waste type	Waste item	Sampling location	Year of sampling	PFAS analy	PFAS class	Analytical method	Concentration value (ppb - ng/g)	Declared	Assumed LOQ/LOD	Concentration value assumed when <LOQ/LOD
Schwartz-Narbonne, H., Xia, C., Shalin, A., Whitehead, H. D., Yang, D., Peaslee, G. F., Wang, Z., Wu, Y., Peng, H., Blum, A., Venier, M., & Diamond, M. (2023). Per- and Polyfluoroalkyl Substances in Canadian Fast Food Packaging. Environmental Science and Technology Letters, 10(4), 343–349. https://doi.org/10.1021/acs.estlett.2c00926	Paper	Bagasse bowl	Canada	2020	PFPrA	PFAAs	LC-MS/MS	1,28			
	Paper	Bagasse bowl	Canada	2020	PFBA	PFAAs	LC-MS/MS	0,75			
	Paper	Bagasse bowl	Canada	2020	PFPeA	PFAAs	LC-MS/MS	0,84			
	Paper	Bagasse bowl	Canada	2020	PFHxA	PFAAs	LC-MS/MS	1,45			
	Paper	Bagasse bowl	Canada	2020	PFHpA	PFAAs	LC-MS/MS	0,15			
	Paper	Bagasse bowl	Canada	2020	PFOA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFNA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFUnDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFDoDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFTTrDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFTeDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFHxDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFBS	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	6:2 FTSA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	6:2 PAP	PFAA precu	LC-MS/MS	58			
	Paper	Bagasse bowl	Canada	2020	8:2 PAP	PFAA precu	LC-MS/MS	27,2			
	Paper	Bagasse bowl	Canada	2020	6:2 diPAP	PFAA precu	LC-MS/MS	< LOQ/LOD		1,60	0,80
	Paper	Bagasse bowl	Canada	2020	6:2 FTOH	PFAA precu	GC-MS/MS	294			
	Paper	Bagasse bowl	Canada	2020	8:2 FTOH	PFAA precu	GC-MS/MS	< LOQ/LOD		1,60	0,80
	Paper	Bagasse bowl	Canada	2020	6:2 FTAc	PFAA precu	GC-MS/MS	< LOQ/LOD		1,60	0,80
	Paper	Bagasse bowl	Canada	2020	6:2 FTMAc	PFAA precu	GC-MS/MS	598			
	Paper	Bagasse bowl	Canada	2020	6:2 FTUCA	PFAAs	LC-MS/MS	4,94			
	Paper	Bagasse bowl	Canada	2020	5:3 FTCA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	ΣPFAS			987			
	Paper	Bagasse bowl	Canada	2020	PFPrA	PFAAs	LC-MS/MS	1,54			
	Paper	Bagasse bowl	Canada	2020	PFBA	PFAAs	LC-MS/MS	1,23			
	Paper	Bagasse bowl	Canada	2020	PFPeA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61
	Paper	Bagasse bowl	Canada	2020	PFHxA	PFAAs	LC-MS/MS	8,5			
	Paper	Bagasse bowl	Canada	2020	PFHpA	PFAAs	LC-MS/MS	1,59			
Paper	Bagasse bowl	Canada	2020	PFOA	PFAAs	LC-MS/MS	0,06				
Paper	Bagasse bowl	Canada	2020	PFNA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61	
Paper	Bagasse bowl	Canada	2020	PFDA	PFAAs	LC-MS/MS	0,19				
Paper	Bagasse bowl	Canada	2020	PFUnDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61	
Paper	Bagasse bowl	Canada	2020	PFDoDA	PFAAs	LC-MS/MS	0,06				
Paper	Bagasse bowl	Canada	2020	PFTTrDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61	
Paper	Bagasse bowl	Canada	2020	PFTeDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61	
Paper	Bagasse bowl	Canada	2020	PFHxDA	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61	
Paper	Bagasse bowl	Canada	2020	PFBS	PFAAs	LC-MS/MS	< LOQ/LOD		1,22	0,61	
Paper	Bagasse bowl	Canada	2020	6:2 FTSA	PFAAs	LC-MS/MS	0,2				

- Material stream
- Waste/product items
- Geographic origin
- Year of sampling/analysis
- Specific treatment on the sample (e.g., accelerated weathering, etc.)
- Parameter(s) analyzed
- Concentration values
- Analytical methods (extraction+quantification)
- LOQ/LOD

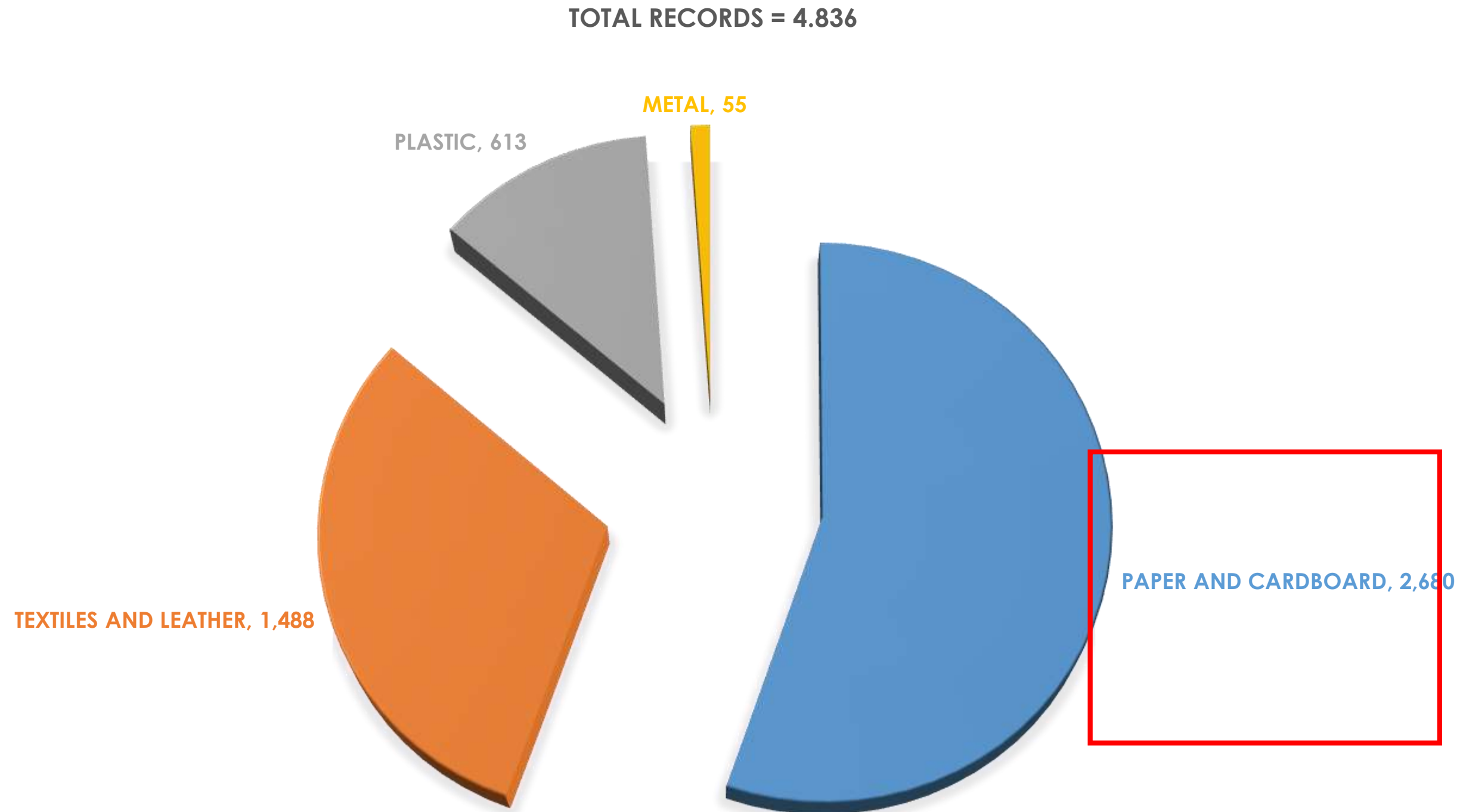
SYSTEMATIC CRITICAL REVIEW - MATERIALS ANALYZED AND RECORDS





Results

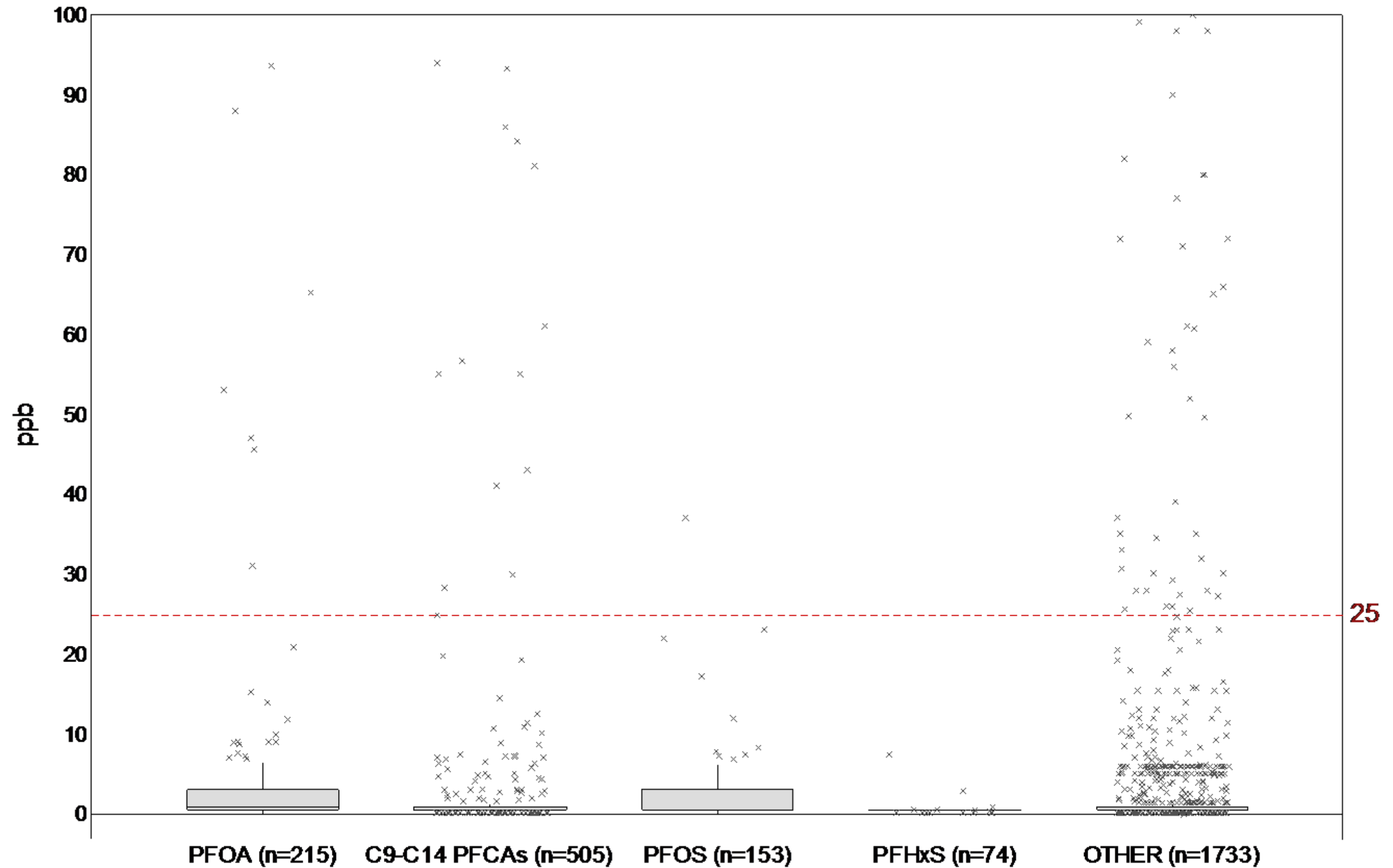
SYSTEMATIC CRITICAL REVIEW - MATERIALS ANALYZED AND RECORDS



ONE EXAMPLE

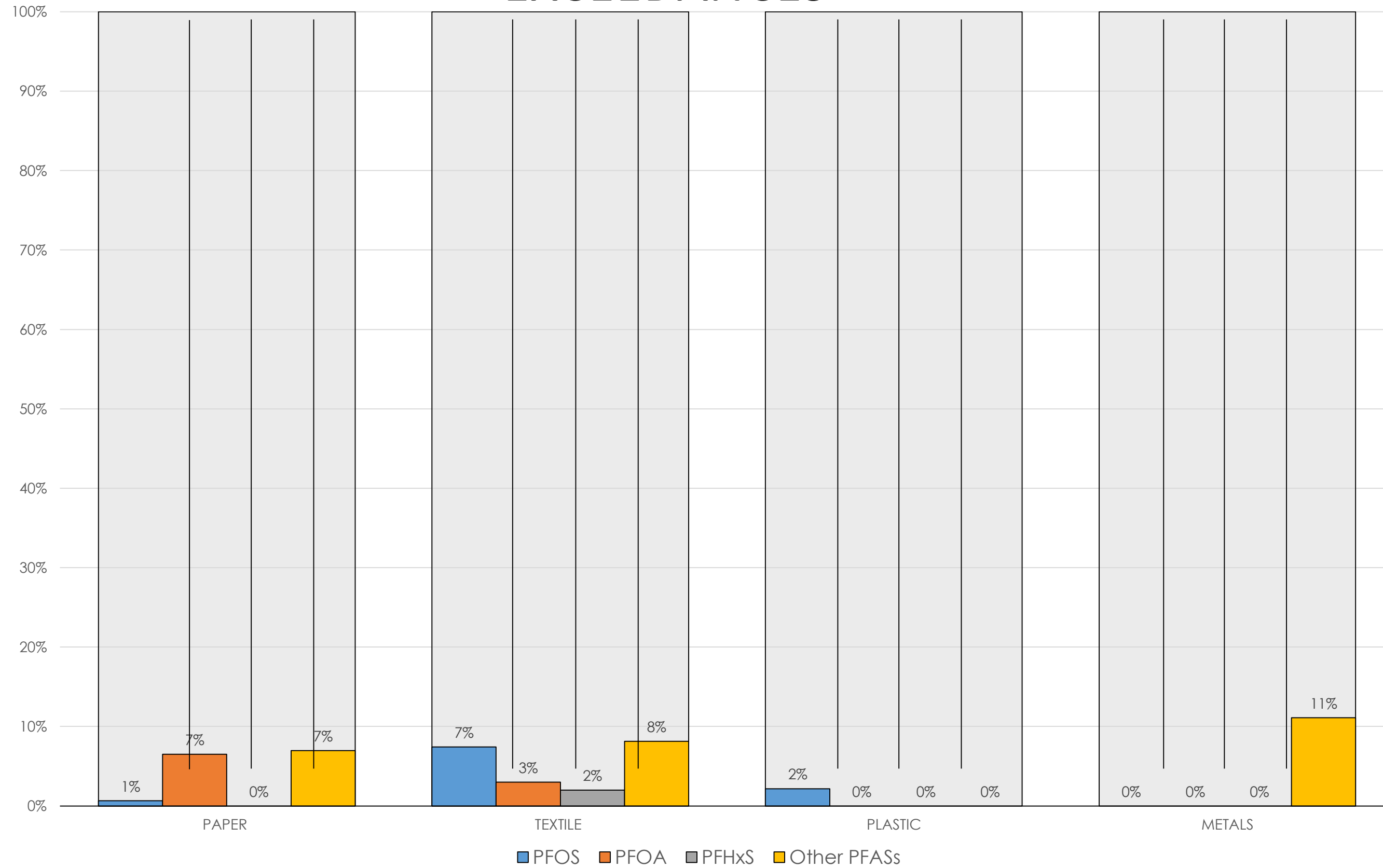
Paper and cardboard
(2680 records)

HIGH HETEROGENEITY



25

% OF LIMIT EXCEEDANCES

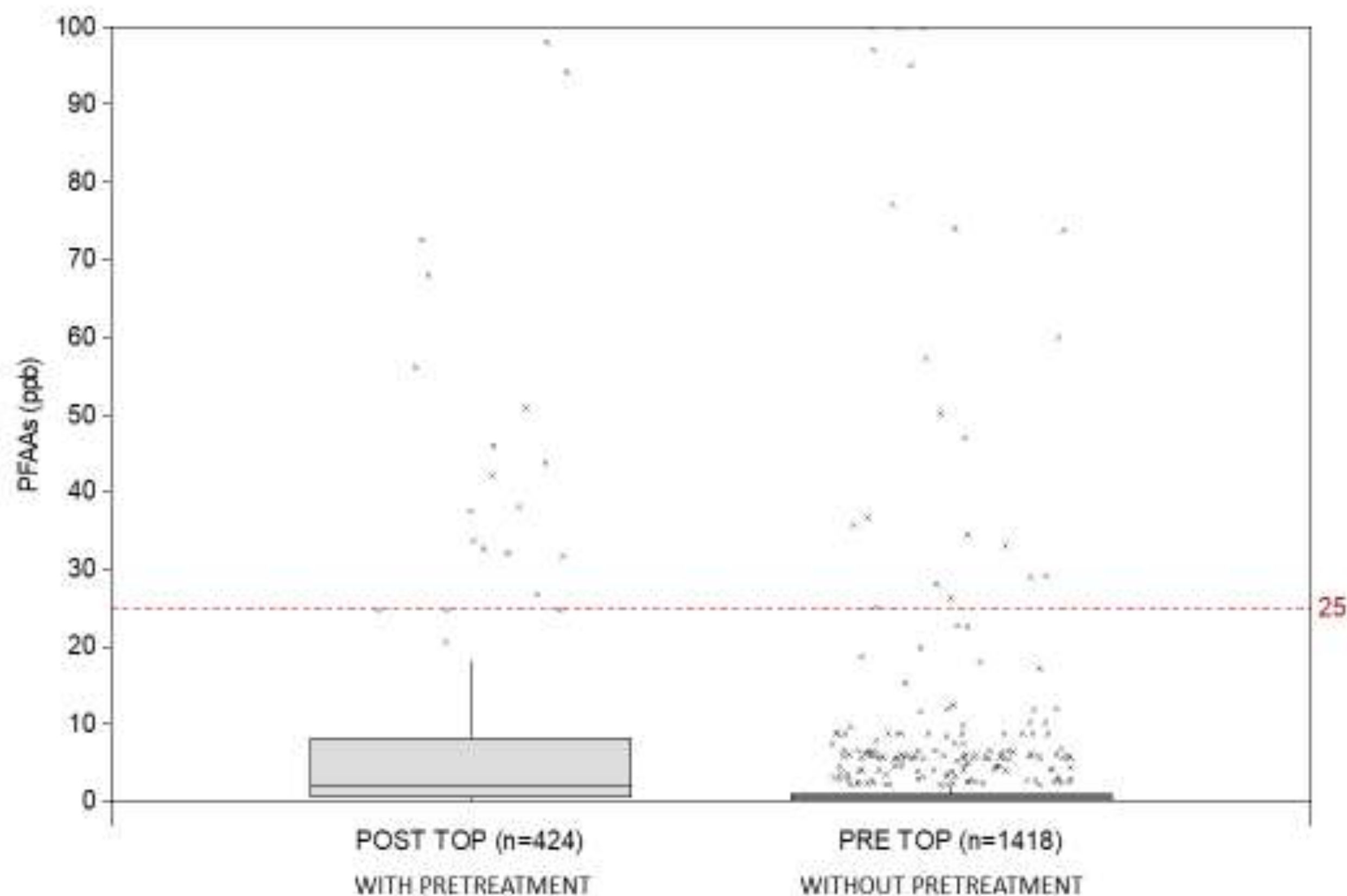


ONE EXAMPLE

Influence of pre-treatment
on test portions of TEXTILE
AND LEATHER WASTE

**When a TOP assay is applied,
a higher concentration of
targeted PFASs should be
expected**

The TOP assay (pretreatment)
allows the conversion of
oxidizable PFASs precursors
into perfluoroalkyl acids
(PFAAs), which are then
measured using a targeted
PFASs analytical method



A «PRAGMATIC» PROPOSAL FOR AN ANALYTICAL PROCEDURE

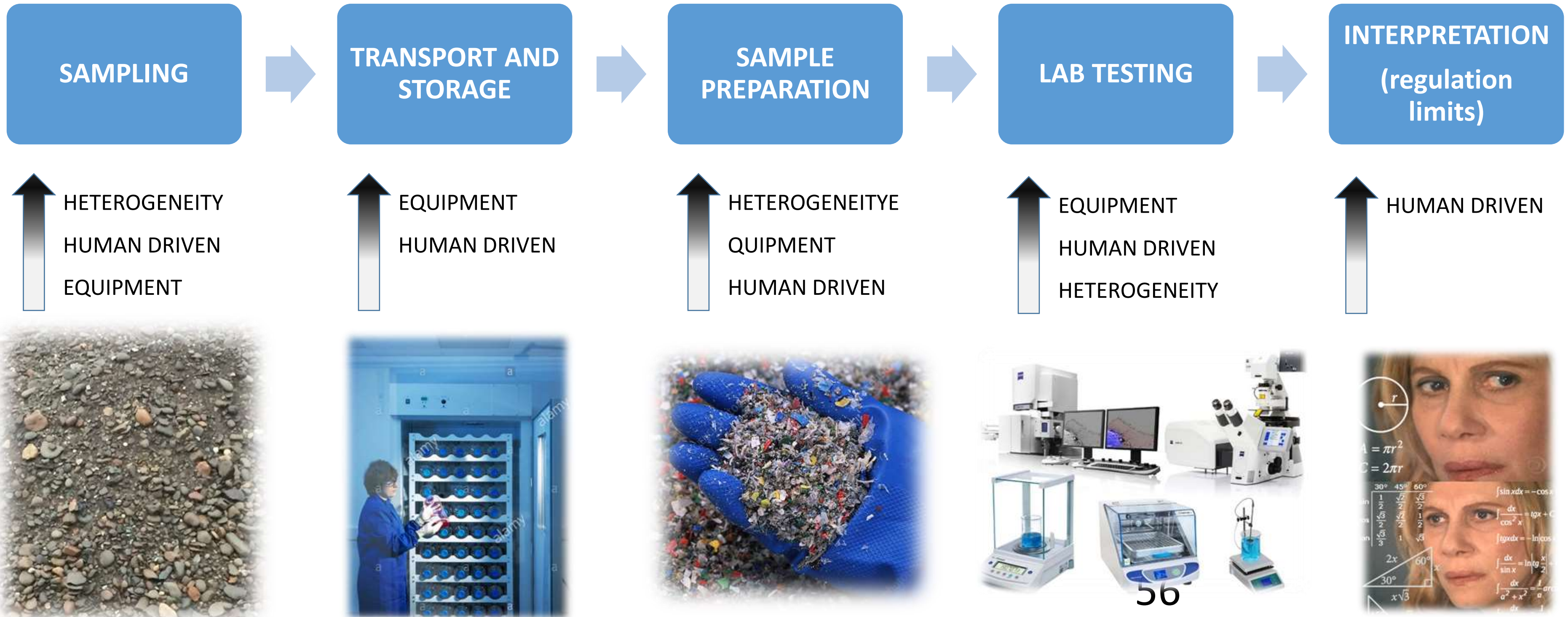
- to identify an **updated**, and **operative definition for PFASs** that is accepted by the scientific community, as the proposal put forward by the OECD in 2021
- define a **screening level** for **all** the PFASs for a **non-targeted** analysis, as total organic fluorine (TOF) analysis, total fluorine analysis (TF)
- if the screening level is **not respected**, a further analysis should be implemented considering **targeted techniques** on the base of a **positive official list** of specific chemicals for which the toxicity of the compounds is known. The limits could be those proposed by BAuA et al, 2023a (i.e., 25 ppb)

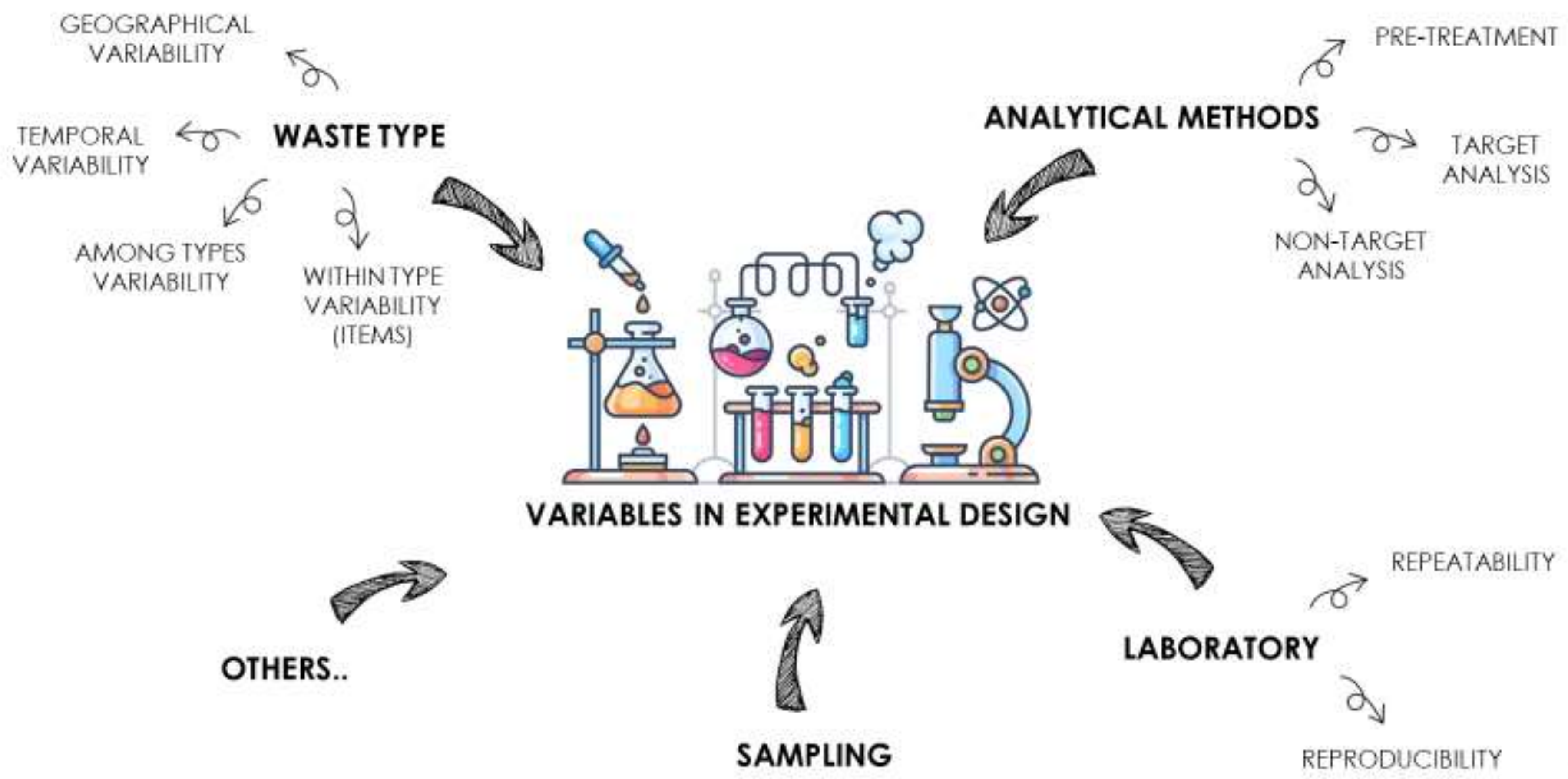




**Further
investigation:
proposal of an
experimental
activities**

MAIN SOURCES OF UNCERTAINTY IN WASTE CHARACTERIZATION







Take home messages

- Un unknown world
- The impact of PFAS new limits is not still analysed in the waste world. Experimental analysis is needed.
- The percentage of exceedances ranged from almost 1% (in paper and cardboard waste) to 8% (in textiles and leather waste). These outcomes could help to understand the impacts of proposed updates of the pertinent legal framework and, in parallel, provide scientific-sound bases for new reliable regulation proposals, able to consider current limitations (e.g., in analytical methods) and guide future research developments.
- Regarding the analytical methods, a pragmatic solution was suggested. This solution combines "not targeted" and "targeted" methodologies in a stepwise procedure, building upon the OECD definition of PFASs.

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Thank you for the attention!

alberto.pivato@unipd.it



QUESTIONS AND ANSWERS

The floor is yours to inquire, discuss, and learn.





PANEL DISCUSSION

The impact on the waste management sector of a potential PFAS ban



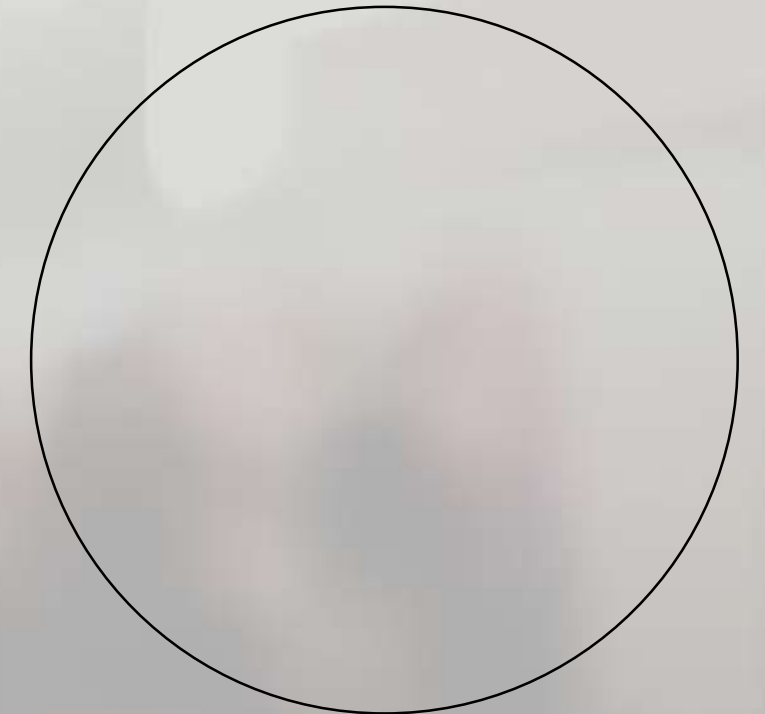
Claudia Mensi
President, FEAD



Michaël Mansuy
Public Affairs Director,
VEOLIA



Alberto Pivato
Assistant Professor,
University of Padova



Guido Premoli
LabAnalysis





REACTIONS AND CLOSING REMARKS

Reflections on our conversation and closing remarks as we conclude our session.





THANK YOU

FOR YOUR PRESENCE

