6th ESA REACH Workshop 2025 - Summary Report

On 17 June 2025, the European Space Agency (ESA) hosted the 6th edition of its ***"Workshop on the EU REACH Regulation and its impact on the Space Sector"*** at ESA ESTEC, The Netherlands.

About this document and disclaimer

This document aims to provide a concise summary of the workshop proceedings, key contents presented and discussions, as well as links for further information / monitoring of progress. It has been prepared by REACHLaw Ltd. under ESA Contract 4000139751/22/NL/AS (CCN2 of 11/12/2024). For further details, reference is made to the Agenda and the individual Presentations.

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Overview of the workshop

The main **objective** of this hybrid (on-site and Webex) full-day event was to raise once again awareness and discuss the current state of play, challenges, and risks with regards to **EU REACH and related environmental regulations** with experts from competent authorities, agencies and industry (including SMEs). In addition, the revised EU political agenda after the 2024 European elections required attention, as the new European Commission set out to put forward a new Chemicals Industry Package, aiming to "simplify REACH" and provide clarity on PFAS (Per- and polyfluoroalkyl substances), in order to boost competitiveness of the EU industry. The workshop, which was organised as a hybrid event, was composed of presentations with opportunities for questions and answers (**Q&A**), interactive Mentimeter surveys, a PFAS mapping brainstorming session and a concluding expert panel discussion (see Table 1 below). More than 130 participants from 24 countries across 4 continents were registered for the workshop.

Table 1 Workshop Agenda

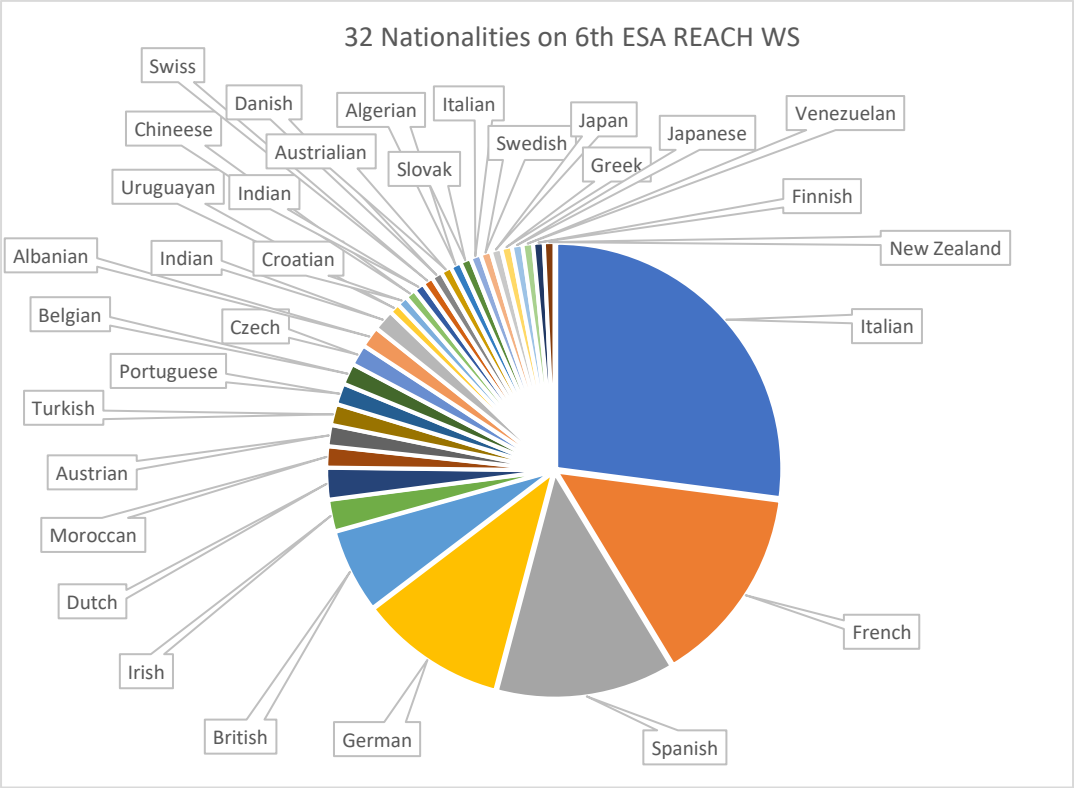
Time CEST	#	Invited Speakers	Topic/Titles
08:15-08:20	1	Nicoletta Wagner (ESA ESTEC)	Introduction & Welcome
08:20-08:50	2	Premysl Janik (ESA, REACH Officer)	ESA REACH Office - Introduction and space sector-wide initiatives
08:50-10:20	3	European Commission: Julian Fabre (DG ENV), Martijn Beekman (DG GROW) and Fabio Vitobello (DG DEFIS)	European Commission update on REACH with focus on Space
10:20-10:50	4	Simone Doyle (ECHA)	Authorisation and Restriction – Updates from ECHA
10:50-11:15		BREAK	
11:15-11:45	5	Fabien Michelin (European Defence Agency)	REACH & Defence: Challenges and perspectives for strengthening European military capabilities
11:45-12:15	6	Tim Becker (REACHLaw)	Update on European Space Sector activities to jointly address EU REACH and related laws
12:15-12:45	7	Paolo Serafini (Thales Alenia Space)	Views and regulatory challenges of large Space Integrator in Europe
12:45-14:00		LUNCH BREAK	
14:00-14:30	8	Oliver Reiff-Musgrove (REACHLaw)	How to use the ESA REACH Tool to monitor regulatory risk and map your PFAS uses
14:30-15:00	9	Leo Fournier (ESA)	Summary of PFAS use mapping across ESA projects
15:00-15:20	10	Miki Kurahashi (JAXA)	JAXA Initiatives for PFAS Obsolescence on Japanese Space Supply Chain
15:20-15:40	11	Premysl Janik + all participants	Response to UPFAS Restriction: brainstorming & how to collect info, data across different uses in the space sector
15:40-16:00		BREAK	
16:00-16:45	12	Panel Discussion Speakers: P. Janik, REACH officer at ESA E. Consoli, ASD Europe R. Boelter , TESAT T. Ziegler, Ariane Group Moderator: A. Coello Vera, REACHLaw	Group Restriction Initiatives and wider EU Chemicals Policy Space agency perspective ASD perspective As DLR Advisor (representing German SMEs) Launcher Perspective
16:45-17:00		Closing Remarks (P. Janik + A. Coello Vera)	
17:00		END	

The workshop was moderated by *Agustin Coello-Vera*, Senior Consultant at *REACHLaw Ltd*. In his brief introduction, he highlighted that the Space Sector is facing new uncertainty due to upcoming chemicals regulatory changes.

Presentations

#1	Nicoletta WAGNER (ESA ESTEC)	Introduction & Welcome
In her opening speech, Nicoletta Wagner from ESA (TEC-S Systems department) and recently appointed Head of new Future Engineering Division, said that last year was an important year for ESA, with adding 9 units to 120+ satellites launched by ESA to date and the inaugural flight of the Ariane 6 launcher, with 40+ upcoming ESA missions. Nicoletta further presented the updated ESA Strategy 2040, which includes five pillars, amongst them being the protection of our planet and climate as well as boosting European growth and competitiveness. To support industries in industrialisation and serialisation, a new Center of Competence (CoC) is being set up in the new Future Engineering Division around three axes defining its focus. Finally, Nicoletta introduced the OSIP (Open Space Innovation Platform) campaign and next steps, as well as the ReUSE! Platform which for example aims to give a second life to ground infrastructure.		
#2	Premysl JANIK (ESA REACH Officer)	ESA REACH Office – Introduction and space sector-wide initiatives
Following brief reflections about the last 5th ESA REACH Workshop 2024 Premysl introduced the agenda and outlined the participation for the present event (see Figure 1)		

Figure 1 6th ESA REACH Workshop – participants by nationality



On the subject matter of REACH, Premysl recalled the complexity of the Regulation and the misalignment of REACH regulatory timelines and long development durations typical for space projects. Legal uncertainty originating from REACH implications is often cause for obsolescence and often confusing, especially for small companies. Therefore we (ESA) jointly with industry try to help to track EU REACH, related laws and their implementations in UK and Switzerland in the frame of the sector-wide Materials and Processes Technology Board (MPTB), which has been chaired by the ESA REACH Officer since its inception. Amongst numerous other activities initiated by the ESA REACH Office, Premysl stressed the new participation of ESA as an occasional observer in ECHA's Committee for Socio-Economic Analysis (SEAC) on the topics of the universal PFAS and Cr(VI) restriction proposals since March/June 2025, as well as the new engagement with ESA projects and industry in PFAS mapping to complement the Space sectorial response of 2023. In addition, another round of awareness raising webinars for SMEs on the topics of REACH and the ESA REACH Tool were conducted in Q1 2025 with the support of ESA's SME Office and REACHLaw Ltd. Premysl also recalled the exchange with JAXA and NASA on "global" regulatory matters, including the successful initiative in 2024 to challenge the UN-level TDG (Transport of Dangerous Goods) proposal already agreed at the end of 2023 to add a special packing provision "PP5" to the UN2029 for Hydrazine Anhydrous, the possible impact of which was finally mitigated with the help of global coordination between European, US and Japanese representatives.

Premysl then provided an update on the number of substances, materials and mixtures tracked with the help of the ESA REACH Tool v5.4. The amount of regulatorily listed substances and PFAS totals more than 18,000 CAS numbers. On the other hand, 1,160 materials and mixtures relevant to space, containing around 3,000 substances, are currently traced via the ESA REACH Tool. Premysl presented a graph with more than 200 materials affected by REACH (~18.2 %) and 67 materials/mixtures in active use have a very high risk of obsolescence (see also Figure 2 below), but these figures still exclude the potential impact based on the 'universal' PFAS EU REACH restriction proposal.

Figure 2 REACH Update by Numbers in 2025 Q1 (ESA)

To illustrate the impact of obsolescence in terms of cost and delay, Premysl provided the example of a new adhesive introduced in space optics, showing how such a new material has to be addressed again from very low Technology Readiness Levels (TRLs) upwards in order to finally achieve space heritage (TRL 9). Once heritage is achieved, it is always regretted that such small volume, but very specific highly added value of chemical is often impacted by EU REACH anyway, and all investment has to start from scratch again, meaning dropping to low TRL level even for well-established technology (optical sensing systems).

Premysl then proceeded to provide an overview of the MPTB, its organisation, working groups and task forces, as well as third party communication, coordination and other exchanges, including cooperation with ASD-Eurospace, exchange with regulators and other industry groups such as ASD (Aerospace, Security and Defence Industries Association of Europe), Cefic and from SMEs.

Regarding **substances in focus** of the Space Sector's attention, Premysl highlighted the state of play and recent joint activities for CrO_3/Chromates, Lead metal, D4/D5/D6 cyclic siloxanes, Bisphenol A and PFAS.

Concerning the **universal PFAS restriction proposal** by five national authorities, Premysl recalled the huge challenge to be addressed, given that all physical forms (solid, liquids, gases) are covered and the material performance based on strong bonds formed between C-F in PFAS substances cannot be simply replaced by any known atoms/chemicals. Therefore, if the restriction was adopted without space-specific derogation, the European Space Sector would face serious issues. Since ECHA reminded ESA, that its scientific committees cannot assess strategic/political messages but instead need detailed information about volumes of PFAS used in the sector, emissions and costs associated with a restriction, the ESA REACH Office is launching sectorial ***action*** to complement the 2023 Eurospace contribution to ECHA through an **ESA-industry PFAS survey phase 2** (link). Results are planned to be reported into ECHA's 2nd public consultation on the SEAC draft opinion, expected during 2026. However, the assessment of the restriction's impact on strategic European space capabilities and who would be conveying such "strategic/programmatic" message, is still an open question according to Premysl.

Premysl further elaborated on the high importance of **D4/D5/D6 cyclic siloxanes** in the European Space Sector with regard to the potential EU proposal to list them to the Stockholm Convention on Persistent Organic Pollutants (POPs). By means of illustration he said that *"the first step on the moon was not the foot of a man but it was a silicone elastomer"*.[1]

In his conclusions, Premysl reiterates the **complexity linked to overall regulatory compliance** which is very challenging to operate in. It well exceeds beyond requirements focused on chemicals and materials to legislation

focused on circularity and sustainability, as well as requirements addressing supply chain resilience/ethics etc. Against this backdrop it is essential to have these kinds of forums for awareness raising and discussions.

In the Q&A Premysl confirmed that ESA top management is more and more aware of the regulatory compliance challenges and are working in order to help mitigate them.

#3	European Commission: Julien FABRE (DG ENV) – *online* Martijn BEEKMAN (DG GROW) – *in person* Fabio VITOBELLO (DG DEFIS) – *contributing*	European Commission update on REACH with focus on Space

Julien FABRE started the Commission's presentation by providing an update on the **"targeted" REACH revision**, with the Commission proposal still planned for Q4 2025. The overall objective is to "simplify rules for the chemicals industry without compromising on safety and environmental protection" (Commission Work Programme 2025). There are three pillars of the revision:

1. **Modernise** information requirements on chemicals, given that REACH is now 20 years old already.
2. Simplify the **authorisation and restriction** processes and digitalise **supply chain communication**.
3. Strengthen **level playing field**, including through **compliance and enforcement**.

He cautioned that we are in a moving environment and nothing is set in relation to the REACH revision. Final decisions will be with the political decision makers at the Commission.

Regarding the possible increased use of the **generic risk management approach (GRA)**[2] still under discussion Julien said that it is not the Commission's intention to target industrial uses in the context of the GRA extension, hence the scope would not extend to the space sector as such.

The next formal opportunity for stakeholders to comment on the REACH revision is **8-week feedback** on the published Commission proposal for the REACH revision.

Martijn BEEKMAN continued to provide an update on **REACH restrictions**, including PFAS, Cr(VI) and lead in ammunition.

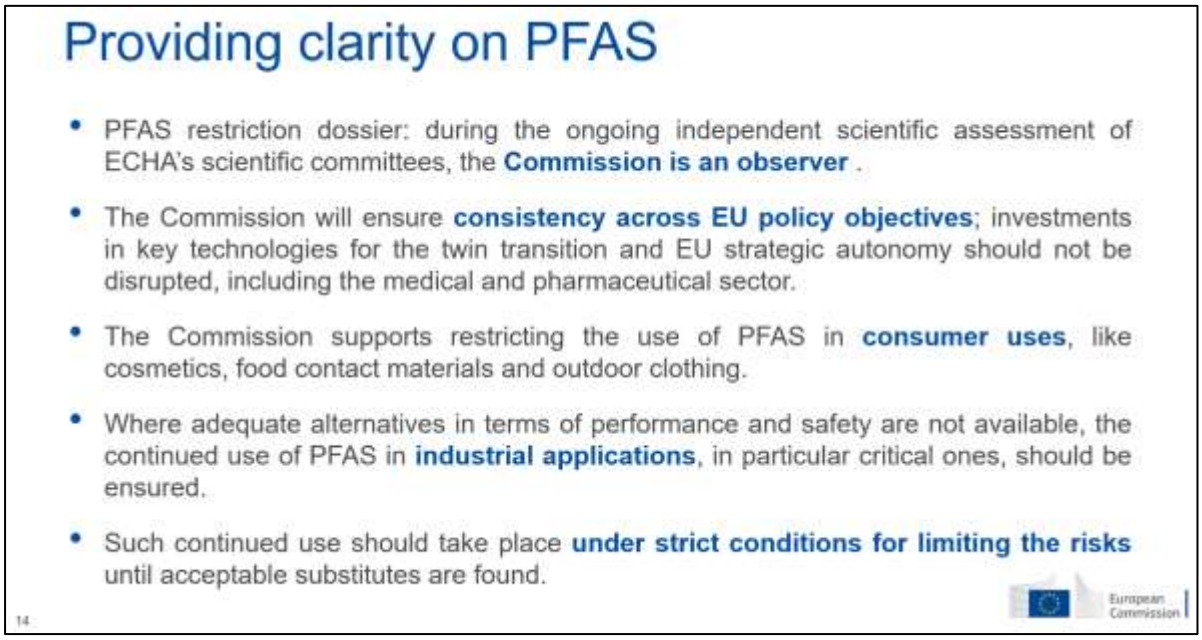
Regarding **PFAS**, Martijn gave an overview of restrictions adopted or underway under the Stockholm Convention on POPs, with a listing of *Long chain PFCAs (perfluorocarboxylic acids)* decided in May 2025. He continued with PFAS-related restrictions under REACH Annex XVII, elaborating on the most recent addition of *PFHxA (perfluorohexanoic acid)* in Entry 79 in September 2024, while the adoption of the PFAS restriction in firefighting foams is expected at the end of 2025. The latter will be subject to certain transition periods and obligatory risk management measures after 12 months.

Regarding the universal PFAS restriction proposal Martijn said ECHA is still assessing the file and the procedure needs to be respected. The Commission needs the ECHA opinion before it can make its restriction proposal. The ECHA process is taking a while, but they are making progress. While the technical assessment is with ECHA, the political part is in the remit of the Commission. The Commission aims to provide clarity on PFAS (see Figure 3).

[1] See also a recent interview with Premysl for Silicones Europe: https://www.silicones.eu/silicones-in-space-an-interview-with-the-european-space-agency.

[2] See current REACH Article 68(2). The generic risk management approach empowers the Commission to propose a restriction based on generic exposure considerations if a substance has certain hazards, and without the involvement of ECHA in the process.

Figure 3 Providing clarity on PFAS (European Commission)



Regarding **Cr(VI) substances** under REACH, Martijn provided an overview of the history under the authorisation system, which saw an increasing number of applications and Commission decisions in the last couple of years. The authorisation approach was judged by the Commission to be no longer appropriate for regulating risk to human health posed by Cr(VI) substances. Therefore, ECHA prepared a restriction dossier on the Commission's request. The ECHA opinion making is expected to be conducted between June 2025 – June 2026, to be followed by the Commission decision. The restriction could be adopted by the **end of 2026** (best case scenario). The authorisation regime remains in force in the meantime. Authorisation obligations will be withdrawn only upon entry-into-force of the Cr(VI) restriction.

Regarding **Lead-free Transition For The EU Space Sector (LETTERSS)** a brief update from DG DEFIS about the ongoing project was provided. The duration of the project is from 1/1/2024 – 31/12/2026.

…

Q&A

Q: There are some missing items in the Commission's update on the planned REACH revision, such as polymer registration and mixture assessment factor (MAF). Are these still considered for the REACH revision?
A: All those elements are still being considered, but this does not mean they will end up in the formal proposal.

Q. Will there be a digitalized REACH Article 33 declaration?
A: The Commission are considering to improve the situation and the interplay with other legislation.

Q: What about the Essential Use Concept in the REACH revision?
A: The Commission still considers whether it could simplify the authorisation and restriction process.

Q: Can you provide more clarity about the timeline for the REACH revision proposal?
A: The responsible Commission DGs need to fix everything by September, and this will be followed by the internal procedure.

Q: With the Commission's 2020 Chemicals Strategy for Sustainability, many of the concepts including expanding the generic risk approach were considered important elements to include in the revision, what has changed and why is the Commission now uncertain about including GRA and other elements of the original proposal?
A: With the new Commission there is a new direction, and the Commission is trying to simplify. The current GRA-based restriction process under REACH Article 68(2) for CMRs in consumer uses works perfectly well.

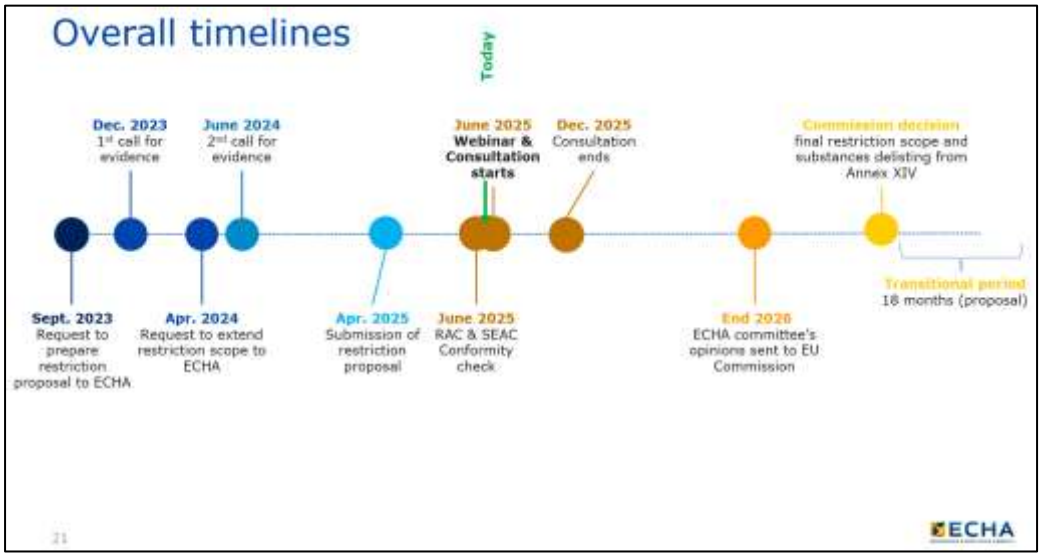
#4	Simone DOYLE (ECHA) – *online*	Authorisation and Restriction – Updates from ECHA

Simone DOYLE, Head of Risk Management I unit at ECHA, presented updates on the following topics:

- Latest news Authorisation – Focus on Cr(VI) substances
- ECHA investigation report on aromatic brominated flame retardants
- ECHA restriction proposal on certain chromium(VI) compounds
- ECHA's tasks under the Batteries and Packaging and Packaging Waste Regulations

Regarding REACH Authorisation, the statistics shared by Simone show that Cr(VI) substances still represent the majority of uses in applications for authorisation and review reports, with chromium trioxide as the most prevalent substance in applications. Regarding the planned restriction for Cr(VI) compounds to address shortcomings of the authorisation process, she then recalled the rationale and Commission mandate (September 2023, amended in April 2024) before outlining the ECHA restriction proposal. The ECHA proposal is to address the risk to human health by **banning use of Cr(VI) substances unless 1.** they fall within a 'closed list' of six use categories (which includes, among others, formulation of mixtures, electroplating and other surface treatments), and **2.** they comply with specific scientific limit values for worker exposure and emissions to the environment (both conditions must be fulfilled). In addition to certain Cr(VI) substances currently on Annex XIV of REACH, different degrees of hydration of the substances as well as salts with a different stoichiometry are also included in the scope. To prepare the restriction proposal, ECHA has conducted two calls for evidence in December 2023 and June 2024. Information has been provided by industry, authorities and other stakeholders on relevant topics related to the restriction proposal. The timeline for the restriction process is presented in Figure 4 below.

Figure 4 Timelines for the Cr(VI) EU REACH restriction process



***Note**: On 18 June 2025, ECHA opened the 6-month public consultation on its restriction proposal for certain chromium(VI) oxides, oxyacids and salts and conducted a webinar for stakeholders. The consultation is available HERE and the webinar HERE. The consultation foresees a 1st deadline for comments on Thursday, 18 September 2025, the end of the consultation is on Thursday, 18 December 2025.*

Under the **Batteries** Regulation (EU) 2023/1542 ECHA is currently preparing a Report on **Substances of Concern (SoC)** in Batteries upon mandate from the Commission with indication of further risk management, including through possible restrictions. The ECHA Report to the Commission is due by December 2026.

Similarly under the new **Packaging and Packaging Waste** Regulation (EU) 2025/40 (**PPWR**) the Commission has mandated ECHA to prepare a Report on SoC in packaging, to be completed by September 2026. Subsequently in the "operational" phase, REACH restrictions for substances in packaging may be imposed. For the **definition of SoCs**, the PPWR makes explicit reference to Article 2(27) of the Ecodesign for Sustainable Products Framework Regulation (EU) 2024/1781 (ESPR). Simone pointed out that the point d) of the SoC definition concerns substances that *"negatively affects the reuse and recycling of materials in the product in which it is present"*. This concept is new from an ECHA perspective, unlike the other hazard-based SoC categories. Those SoCs that are found to negatively affect the re-use and recycling, may be subject to restrictions under the design for recycling criteria of the PPWR.

ECHA invites stakeholders to provide information on substances in batteries and packaging by participating to its Calls for Evidence.

Q&A

Q: Can you expand on whether ECHA and other EU agencies/authorities will use and apply the ESPRs SoC definition? Is this likely to be the definition that industry should be keeping a close eye to see upcoming regulatory action?

A. It is great that we have the ESPR definition now, keeping an eye on that definition is very important for both batteries and the PPWR as sector-specific regulations. However, she also clarified that REACH does not foresee a reference to the SoC definition.

Q: The transition from the authorisation to the restriction regime for chromates, will happen from one day to another?

A: This is not an easy one for ECHA; the Commission are discussing the question. One of the main questions will be how the transition will work. I recommend to keep an eye on the Commission's Q&A, maybe there will be more clarity by the autumn time.

Q: Will Cr(VI) substances to be restricted also be removed from the REACH Candidate List?

A: No, only a de-listing from Annex XIV is planned and applicable.

#5	Fabien MICHELIN (EDA)	REACH and Defence: Challenges and perspectives for strengthening European military capabilities

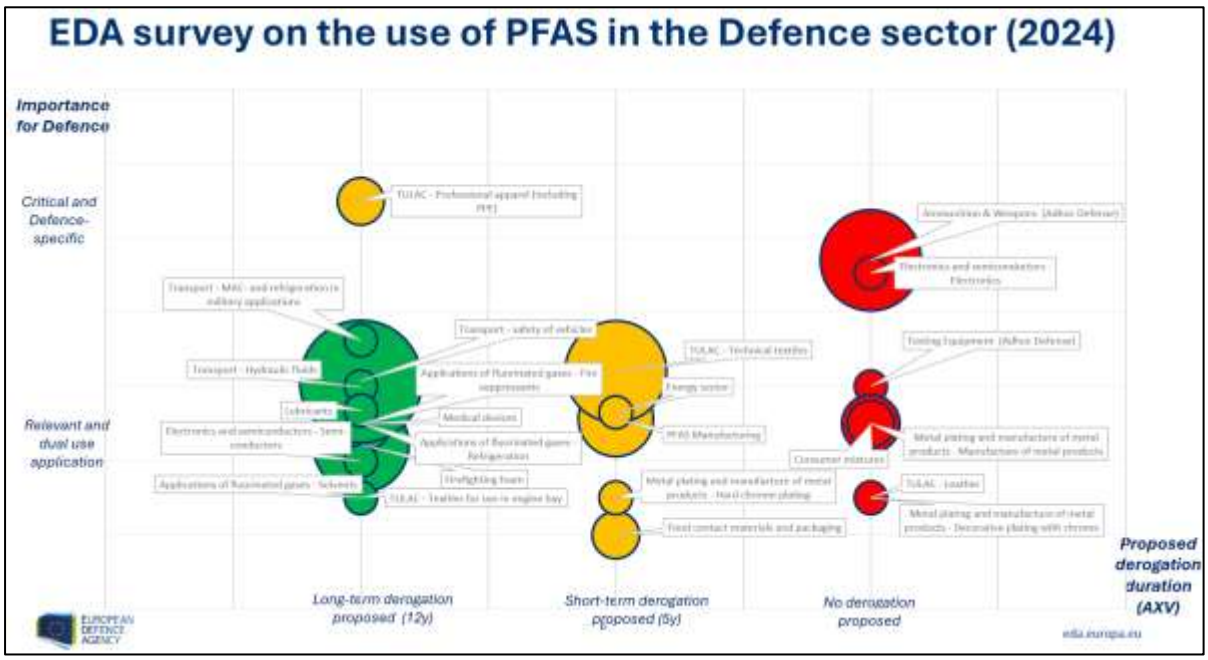
Dr. Fabien MICHELIN has been Project Officer REACH at the EDA since October 2024. At the outset Fabien recalled the role of the EDA as an intergovernmental agency of the Council of the European Union. The EDA Steering Board, composed of 27 Defence Ministers, is chaired by Kaja Kallas. Among others, the EDA operates as the military **interface between Member States and EU wider policies**; the EDA's activities on REACH integrated into this priority work strand focus on building a common understanding/exchanging best practices in the REACH Regulation implementation, identifying and mitigating the impact of REACH to defence and supporting harmonisation of national policies and procedures regarding granting of REACH defence exemptions, between EDA and Member States. EDA's work on defence-related REACH+ matters has been ongoing since 2009 and is currently governed under the 'REACH+ Roadmap 2024-2026'. Partners include the European Commission, ECHA and ESA. The EDA REACH Task Force is composed of REACH/defence experts of 11 Member States and Norway supporting EDA's work at technical level.

Fabien outlined the main achievements of the EDA in terms of REACH+ activities since 2009. These include for example the EDA Codes of Conduct (CoC) on REACH (2015) and CLP Defence Exemptions (2022), regulatory impact studies (REACH/CLP in 2016, other chemical/waste regulations in 2020/21) and more recently more dedicated

efforts on the PFAS topic, with a focus of a dedicated PFAS Working Group first on firefighting foams, and later extensions to military textiles, fluorinated gases, ammunition and weapon systems.

The results from an EDA survey on the use of PFAS in the Defence Sector in 2024 show that no derogation has been proposed in the universal PFAS restriction proposal for some critical and defence specific applications such as for ammunition and weapons while there are many relevant and dual use applications in the scope of the restriction proposal which are subject to different time-limited or no derogations (see Figure 5).

Figure 5 EDA survey on the use of PFAS in the Defence sector (2024) – Importance for Defence vs. derogation coverage



Fabien MICHELIN further mentioned new EU initiatives with implications for the Defence domain, including the Commission White Paper for European Defence 'Readiness 2030' and the Chemicals Industry Package. The Defense Omnibus Simplification Proposal released on 17 June 2025, which builds on the vision set out in the aforementioned White Paper, also includes chemical regulations such as REACH.[3]

Before concluding, Fabien highlighted **key aspects for enhancing the EU military step up** in the context of REACH and Defence. This includes enhancing the consideration of defence concerns in the chemicals regulatory process and Security of Supply maintaining European chemicals supply chain to enhance the European strategic autonomy. Although not directly within the scope of restriction proposals, the defence sector is increasingly affected indirectly, particularly regarding potential disruptions of civilian supply chains which are critical for defence systems production.

In his conclusions, Fabien MICHELIN said that the potential impacts stemming from the restriction proposals on PFAS, Chromium(VI) substances and the proposed REACH revision are of major concerns for the European Defence sector. He stressed the crucial role of **information exchange** on regulatory developments within different sectors to identify direct and indirect impacts. In this context he also mentioned the upcoming **16th EDA REACH Plenary Meeting** in Brussels on **22 October 2025**, which will be a Day open to Industry.

[3] Further information: https://commission.europa.eu/news-and-media/news/new-simplification-proposal-will-speed-defence-investments-eu-2025-06-17_en.

Q&A

Q: With respect to critical materials, what is really the EDA's priority in defence? REACH and PFAS? Or rare earth elements?

A: The answer is both. While REACH has been in place for over 15 years now, the notion of Security of Supply was not well identified. Now this has changed with the war in Ukraine etc.

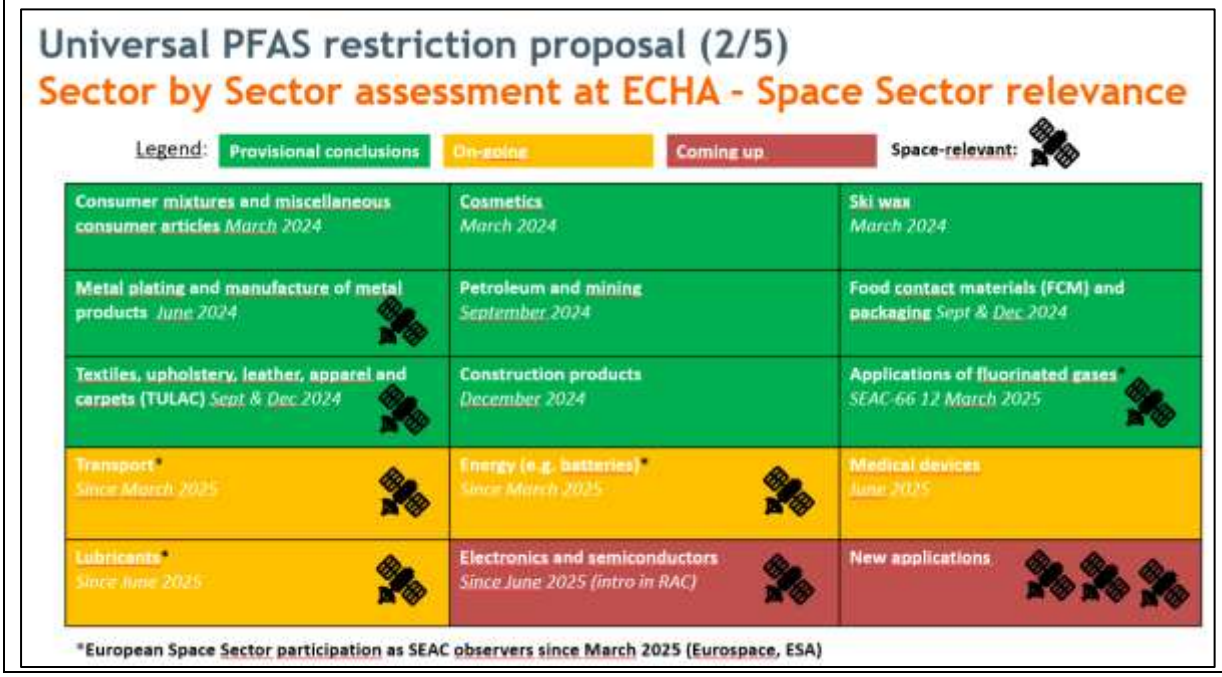
#6	Tim BECKER (REACHLaw)	Update on European Space Sector activities to jointly address EU REACH and related laws

Tim BECKER, Senior Legal Advisor at consultancy REACHLaw Ltd., introduced his presentation by highlighting that given its specificities as a high-end niche sector the Space Sector is very vulnerable to chemicals restrictions, even more if they are group based.

He then reflected on **how Space is recognised** through scope exclusions, exemptions and other special provisions in different EU laws governing chemical safety and environmental sustainability. In a number of product and waste-related laws (e.g. RoHS) there are scope exclusions for *"equipment designed to be sent into space"*. However, in chemicals laws such as EU REACH and POPs Regulations there are only limited sectorial derogations / exemptions covering space applications, typically embedded in differently worded clauses covering the wider aerospace and defence domain or as part of sector-agnostic exemptions (e.g. REACH Art. 56(4)(d), 2nd alt. – "use as fuels in closed systems", Art. 3(23) – Scientific R&D). The ESPR Regulation (EU) 2024/1781 is a recent example which recognises the strategic role of the space industry and the extreme operating conditions (Recital (19)). Overall, the approach across different laws appears non-harmonised.

Regarding the **universal PFAS restriction proposal** Tim provided an overview of the complex context of existing EU regulations and initiatives for PFAS substances under EU REACH and POPs Regulations and identified a lack of reporting duties and hence information availability for PFAS in articles, because only part of them are identified as SVHCs in the EU REACH SVHC Candidate List. Regarding the on-going sector-by-sector assessment at ECHA Tim then pointed out that many of the sectors as defined by the dossier submitters are relevant for space applications, and that – despite the progress in SEAC – the bulk of space-relevant sectors (e.g. electronics and semiconductors, new applications / missing uses) is still expected to be discussed in future meetings (see Figure 6).

Figure 6 Space relevant sectors in the universal PFAS restriction proposal and opinion-making process



Tim then provided an overview of joint European Space Sector activities on PFAS during the last year and coming up, as well as challenges encountered during the on-going opinion-making process. The main evolution has been the active participation as SEAC observers (Eurospace, ESA) since March 2025. A current focus within ESA and the MPTB Space Restrictions Task Force (RTF) is the preparation for ECHA's 2nd public consultation on the SEAC draft opinion, which could occur during 2026. Tim particularly stressed a perceived confusion due to full Ban approach of the universal PFAS restriction proposal while non-Ban options have been raised by dossier submitters ("Option 3") and Commission since November 2024 (see also COM presentation above under #3 and Figure 3).

Finally on universal PFAS, Tim recalled the 2023 Eurospace input (ECHA ID # 8544) and the key requests submitted to ECHA given the numerous derogation gaps, including the need for a space sector-specific derogation for PFAS uses in equipment designed to be sent into space.

Regarding **Cr(VI) substances**, Tim elaborated on the double transition that the space industry has to manage under EU REACH: 1) On-going: Change of authorisation title from CTACSub to ADCR for chromium trioxide, 2) Coming up (from around 2028): Change from the Authorisation to the Restriction system, based on the request of the European Commission to ECHA. A number of initial observations and possible concerns were already identified in the space sector, such as the coverage of salts in the restriction proposal, while there is no exhaustive list of CAS numbers and the possible premature loss of right to continue use based on granted (ADCR) authorisations until mid-2030s. The next step for the European Space Sector is the response to the ECHA public consultation which started on 18 June 2025 (see above ECHA presentation under #4).

Regarding the **SCIP reporting** requirements, Tim showed the rising number of notifications for space-relevant article categories according to the REACHLaw analysis of the SCIP database, while no benefit is seen further and beyond REACH Article 33 declarations for products sent into space, as recently flagged to DG Environment again.

Tim then briefly touched upon the non-REACH topic of **"substances of concern"**, which pose new challenges for compliance (e.g. CSRD reporting) and obsolescence management also in the Space Sector given the wide definition (see also above ECHA presentation under #4).

Furthermore, he provided a status update for the **Space Energetic Materials Working Group (EMWG)** which tracks a list of currently 84 substances used or under research for use in space propellants and explosives. He also recalled the EU REACH exemption position for hydrazine and other liquid propellants and recent activities to remove a previously agreed adverse proposal to add a special packing provision "PP5" to UN number 2029 for hydrazine anhydrous.

Finally regarding the **REACH revision**, Tim recalled the European Space Sector Position of 13 April 2022. He noted that the new ideas of the European Commission on the *digitalisation* of supply chain communication on SVHCs in articles via Digital Product Passport (CARACAL, 3 April 2025) require a careful analysis and impact assessment.

Q&A *Asked about ongoing activities in the European Space Sector as regards the Digital Product Passport, Tim answered that the developments in other sectors (e.g. steel, textile products, batteries) are currently only being monitored. It is considered to introduce a dedicated point for attention in the MPTB / SCIP Task Force, even more with regard to the possible uptake of the DPP in the REACH Revision.*

#7	Paolo SERAFINI (Thales Alenia Space - TAS)	Views and regulatory challenges of TAS as Large Space Integrator in Europe

Paolo SERAFINI, Deputy HSE Coordinator and REACH Officer for TAS in Europe, introduced his presentation by pointing out that chemicals regulatory compliance brings significant changes and challenges to TAS's space business, requiring continuous adaptations and innovation to ensure its space missions remain safe, sustainable and compliant. He observed that more and more in recent years it is not only the EU REACH Regulation that is being monitored, but an extension of the Directives or Regulations that deal with chemical products or raw

materials is now being considered: among all of these, the EU POPs Regulation is now kept under strict control and monitoring. Altogether, these regulations influence the selection of materials and chemicals used in space products, require a proactive approach to ensure compliance and effective obsolescence management.

Paolo further elaborated on the impact of chemicals regulations on design, production and use of space components while at the same time highlighting the need for space systems reliability and performance supported by the substances currently in use. Finding alternatives without compromising performance requires a collaborative effort between engineers, materials technicians and regulatory experts, as well as an innovative approach to balancing performance and compliance. He gave a number of specific examples of critical materials or substances for TAS and considerations on alternatives, including for:

- **Electronic Materials and Metal Alloys**, e.g. cadmium and lead in electronic components
- **Coatings and Protections**, e.g. zinc chromate used to protect metal components from corrosion which is now in scope of the ECHA restriction proposal for Cr(VI) substances (while not included in Annex XIV of REACH)
- **Composites and Adhesives**, e.g. Bisphenol A used in epoxy resins to reinforce composite structures
- **Propellants and Lubricants**, e.g. Hydrazine propellant, PFPE (Perfluoropolyether) and PFAS used in mechanical components to operate maintenance-free in extreme space conditions.

Finally, Paolo provided some examples on R&D projects in order to create **new advanced materials** that comply with the regulations and performance requirements of the space sector. These cover Advanced Composite Materials, Thermal Protection, Self-healing materials, Advanced Sensors and Smart Materials, R&D Laboratories and Equipment.

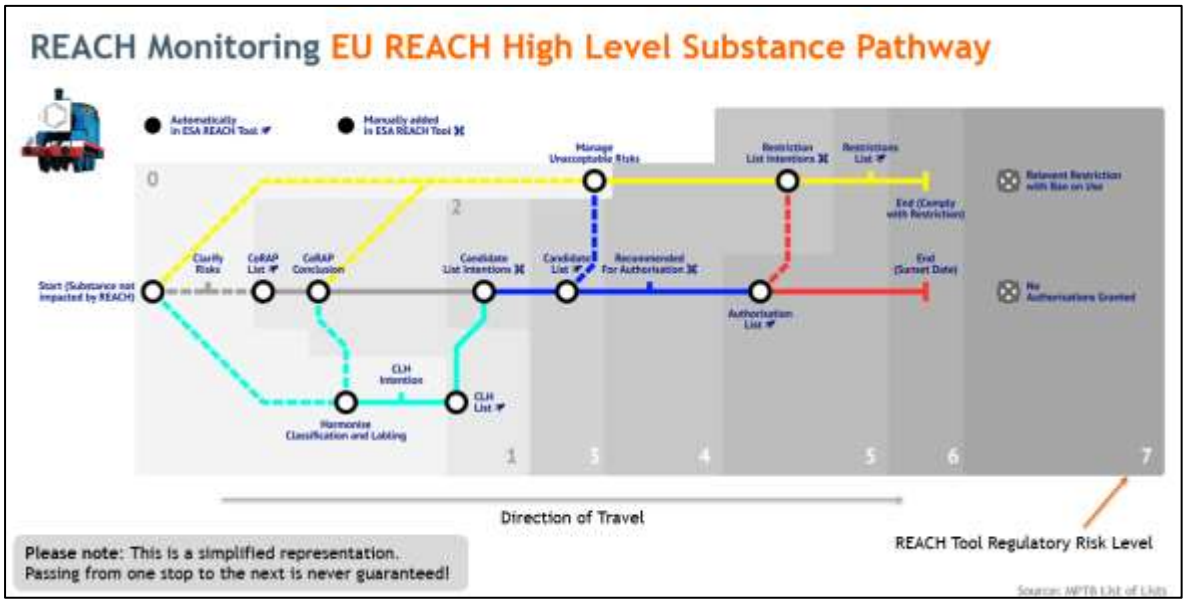
In the **Q&A** *Paolo commented on questions regarding substitution challenges for REACH-regulated chemicals used in the space sector. According to Paolo, R&D budgets generally depend on the revenues of the companies. TAS have spread their available budget on different materials more than before, e.g. to investigate replacements to PFAS, lead or siloxanes. Asked about national enforcement differences, Paolo highlights the increasing regulatory differences in the UK, which for example has no SCIP notification requirement.*

#8	Oliver REIFF-MUSGROVE (REACHLaw)	How to use the ESA REACH Tool to monitor regulatory risk and map your PFAS uses

Oliver REIFF-MUSGROVE, Senior Product Manager at consultancy REACHLaw Ltd., introduced the topic of the ESA REACH Tool, a digital regulatory obsolescence tool that Oliver has been working on for over 5 years. He explained that this would be a more holistic presentation, but for hands on presentation he directs the audience to the 2025 SME webinar.

Oliver described that the goal of the REACH Tool is to find the overlap between regulated substances and space materials, and the data problem facing the European Space Agency and its supply chain from both regulatory substance lists and space materials data perspective. On monitoring the evolution of substance lists, challenges outlined include deconvoluting regulatory substance paths and a dearth of real-time substance list data from regulators (see Figure 7).

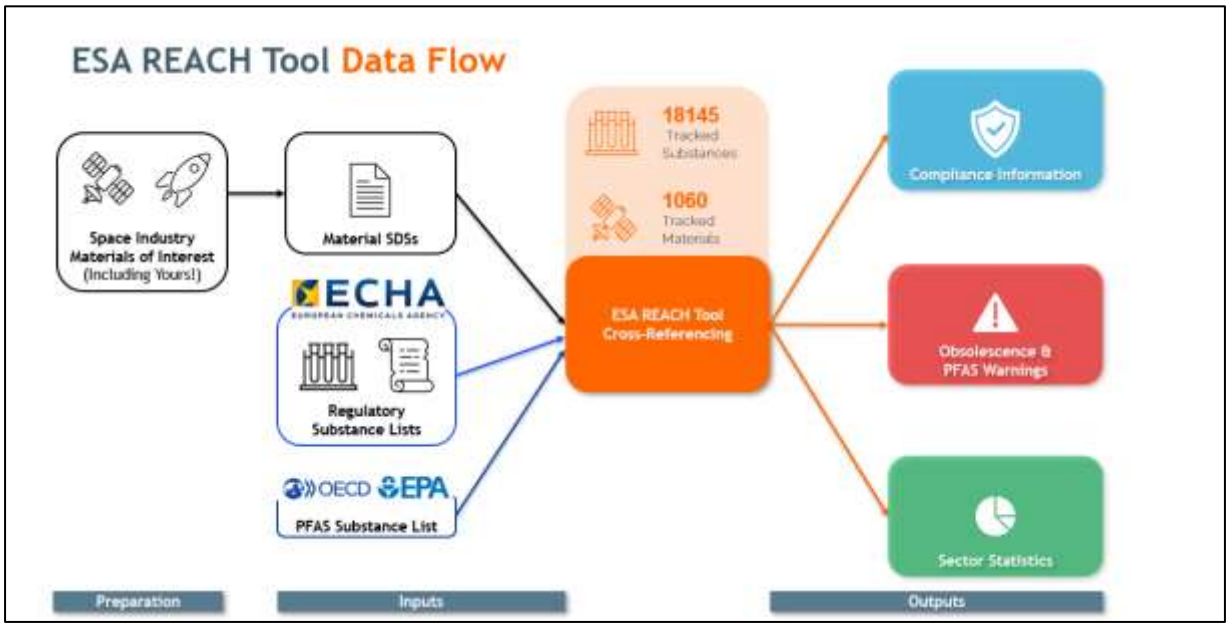
Figure 7 Illustration of EU REACH High Level Substance Pathway to predict regulatory outcomes



On finding materials data to track, Oliver mentioned the issues surrounding the incompleteness of Declared Materials Lists data, which cannot provide the full chemical visibility required for comprehensive regulatory impact analysis.

Instead, the ESA REACH Tool was presented as the solution this data gap. Through inputting generally used space materials and indexing exhaustively the Safety Data Sheet Section 3 CAS numbers, a much clearer picture of regulatory impact can be constructed (see Figure 8). This is particularly pertinent for mapping the impact of the universal PFAS restriction on the space materials, with over 10,000 substances to analyse.

Figure 8 ESA REACH Tool Data Flow



Finally, Oliver encouraged those who have an ESA entity code to sign up to the ESA REACH Tool and mark the materials they use using the confidential My Materials star, to continuously improve the quality of the materials usage data, to help inform future consultations and materials substitution efforts.

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Q&A

Q: Are you using AI in any of these processes, can AI help anywhere?
A: The development was primarily conducted before 2022 when AI really came to prominence, but it is being looked into for things like SDS indexing.

Q: You didn't show any usage data, how many users do you have?
A: We have over 200 users registered, about half are active. At all levels of the supply chain.

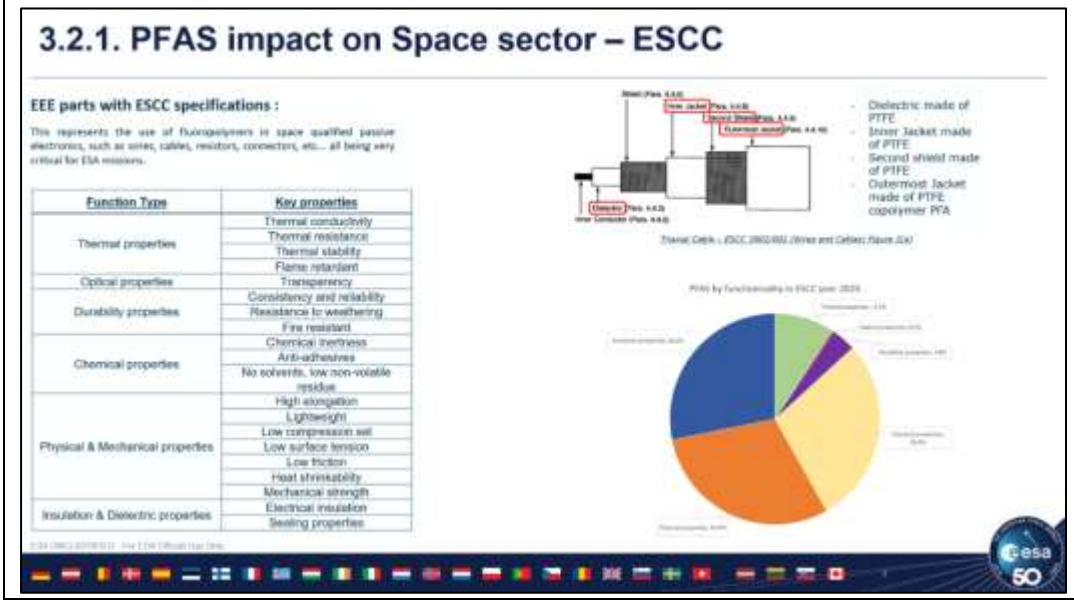
Q: What about articles for which there are no SDSs?
A: Challenging because you do not get SDSs for articles, but it is something we are looking into for sure.

#9	Léo FOURNIER (ESA)	Summary of PFAS use mapping across ESA projects

Léo FOURNIER, a chemical engineer and graduate trainee at ESA since 2024, said that replacing PFAS in space-relevant materials is an exceptionally complex challenge due to the unique combination of properties these substances offer- properties that are critical for the extreme conditions encountered in space missions. PFAS compounds provide unmatched thermal stability, chemical inertness, low friction, electrical insulation, mechanical durability, and many others. These characteristics are not just beneficial; they are essential for ensuring the reliability and safety of spacecraft components, from wires and cables to thermal blankets or structural fabrics.

In space-relevant projects, PFAS are deeply embedded in standardized materials and components, such as PTFE-based insulators in ESCC-qualified cables, fluoropolymer coating in fabrics or perfluorocarbon fluids used in hermeticity testing. Their use is not optional but driven by performance requirements and long qualification cycles that leave little room for compromise (see Figure 9).

Figure 9 PFAS impact on Space sector – ESCC



ESA is currently undertaking a comprehensive mapping of PFAS-based materials across its projects to better understand where and how these substances are used. However, this task is particularly difficult when it comes to PFAS-containing articles, where chemical composition is not always transparent and traceable.
Despite these challenges, the goal is to protect the space sector by ensuring that its specific needs are recognized in regulatory discussions, particularly in the context of the evolving PFAS restriction proposal.

While alternative substances are being explored, none currently replicate the full spectrum of PFAS functionality under space-relevant conditions. If performance were not the priority, more affordable and less complex materials would be used, but in the space sector, where failure is not an option, PFAS remains nowadays indispensable.

…

Q&A

Q: Are there already approaches/alternatives to substitute PTFE?
A: There are ongoing efforts to identify PTFE-based materials, but it's quite complicated as it's the most used and it offers a unique combination of functionalities. For some cases, we are ready to conduct some comparative testing on new materials, but more to evaluate their performance under space-relevant conditions in case of immediate obsolescence. So still PFAS-based, but not for PFAS-free alternatives.

Q: Did you reach a point where you prioritize for replacement or obsolescence?
A: Difficult to do mapping. The ESA REACH Tool is used to see what is most used. Difficult to say at ESA which material is more important. We are aware of discontinuation (eg 3M PFAS based product), so for the moment we are trying to replace work on this immediate obsolescence than the potential future restriction. We want to ensure the continuity of space missions and to avoid supply chain risks.

Q: In the majority of SDSs we do not find information about the presence of PFAS and no chemical composition is attributed to the product. How can we determine the presence of PFAS in a product to proceed to its substitution?
A: This is one of the most significant challenges in the mapping process. As Oliver said, many SDSs do not disclose full chemical compositions, especially proprietary formulations or articles. What is possible to do:

- *Cross referencing, PFAS trade names and functions*
- *Consulting TDSs and manufacturers websites*
- *Engaging with suppliers to request detailed composition or confirmation or not of PFAS content*
- *Using internal knowledge and expert*
- *Feeding findings into the ESA REACH Tool*

#10	Miki KURAHASHI (JAXA)	JAXA initiatives for PFAS Obsolescence on Japanese Space Supply Chain

Miki KURAHASHI, Associate Senior Engineer for Parts Program Group of Safety and Mission Assurance Department in JAXA (Japan Aerospace Exploration Agency), provided an overview of the impact of PFAS restrictions on JAXA projects and JAXA supply chain, as well as JAXA initiatives to address PFAS issues. The latter work has been on-going since April 2024.

Identified PFAS use cases in launchers and spacecraft of JAXA projects are summarised in Figure 10.

Figure 10 Impact of PFAS restriction on JAXA projects – PFAS use cases in launchers and spacecraft (Source: JAXA)

Parts	Brand	PFAS material
Cable	-	PTFE
	-	ETFE
	-	TFE
	-	PFA
Terminals	-	PTFE
Packing/sealing	-	Kynar (homopolymer and copolymer of VDF; vinylidene fluoride produced by ARKEMA)
	-	PTFE/FEP
Tubes	-	PTFE
	-	Kynar
	-	FEP (Copolymer of TFE and HFP)
	-	Teflon
Cooling medium	FC-72	-
	NOVEC 7200	-
Insulator	beta cross	-
	-	Silver Teflon

Future plans of JAXA to address PFAS issues include further study on alternative materials (to Fluorinert/Novec), a 2nd PFAS Workshop in August 2025 and Coordination with ESA and NASA to exchange information, with possible regular meetings.

Regarding other substances, Miki highlighted **Lead metal**. In Japan, there is no regulation to limit the use of Lead metal. However, JAXA is impacted by the global trend to transition to lead-free solder. In April 2024 a "Lead Free Parts application Standard for Space Equipments and Systems" (JERG-0-064) was established. Going forward, JAXA monitors the lead-free transition activities in Europe. In the latter regard, Miki cautions that if lead was totally banned in Europe, there would be much more impacts on the Japanese space sector.[4]

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Q&A

Q: How are PFAS currently regulated in Japan?
A: There is regulation covering PFOA and PFOS.

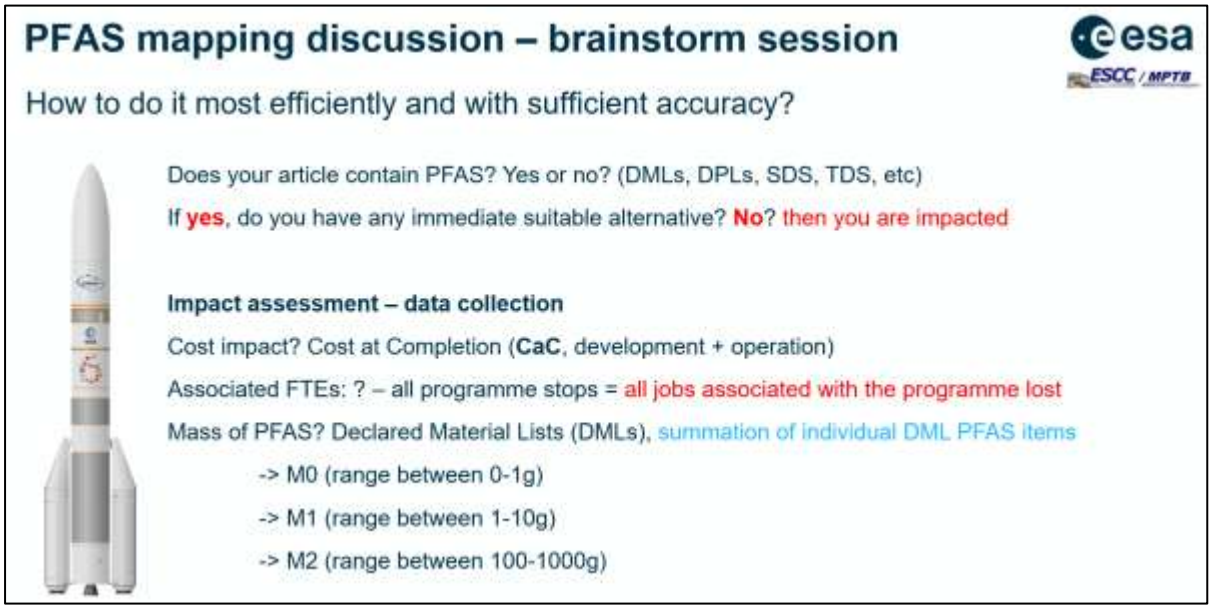
***Note**: An overview is available in a presentation by the Japanese Ministry of Environment for an OECD Webinar on 11 December 2024, available HERE.*

Q: Is the space sector looking to innovate new alternatives to PFAS, independently from the rest of the chemicals sector, for the functions they need?
A: The Space Sector is not in the driving seat, it rather starts by identifying obsolescences.

#11	Premysl JANIK (ESA) & all participants	Response to UPFAS Restriction proposal: brainstorming & how to collect info, data across different uses in the space sector

Premysl JANIK introduced a brainstorming of the workshop participants on how to collect meaningful information on PFAS across different uses in the space sector. He recalled a number of challenges for this endeavour, such as the small volumes at stake, use of different PFAS definitions in EU vs. other jurisdictions (e.g. UK) and raised a number of questions (e.g. on the need to perform destructive analysis) and suggestions on how to estimate and quantify the impact of a PFAS ban (see Figure 11).

Figure 11 PFAS mapping discussion – brainstorming session (Source: ESA)



Possible solutions raised by workshop participants included the use of AI to estimate how much PFAS is in a complex object or the identification of "decisive parts" in a spacecraft to help focus substitution efforts. The European Commission attendee commented that the different PFAS lists available are not so different, and one could concentrate on some 200 substances commercially on the market. Another participant countered that this creates the risk of missing other cases. Another possible approach to simplify the mapping could be to focus on some specific uses where release to the environment can be expected. Wires for example are used a lot and would be a product to look at. It was also suggested that Infrared and Raman spectroscopy could be used to complete the mapping.

Another space sector representative cautioned that the space industry is usually not able to drive suppliers. While it is good to know where the critical PFAS applications are, this does not help find a supplier to do the substitution work for the space sector. The market will not ask the space sector first.

[4] **Note**: At the 5th ESA REACH Workshop on 19 June 2024 the European Commission has stated that it does not intend to include lead in the EU REACH authorisation list, see HERE.

Panel discussion

#12	**Panel Discussion** - Elisa CONSOLI (REACH and Chemicals Manager, ASD - Aerospace, Security and Defence Industries Association of Europe) - Ralf BÖLTER (Head of Technology Engineering, TESAT-Spacecom) – as DLR advisor (representing German SMEs) - Thorsten Ziegler (REACH Manager, ArianeGroup) - Premysl JANIK (REACH Officer, ESA) - Agustin COELLO-VERA (Senior Consultant, REACHLaw) – moderator **Topics: Group Restriction Initiatives and wider EU Chemicals Policy**

The panel discussion was divided in several blocks and interactive with questions from workshop participants.

REACH Revision – Next few years

Panellists are asked how they see the future evolution of the EU REACH Regulation, especially with the planned REACH Revision. There is consensus about the big uncertainty due to the unpredictability in this regard, with critical elements of the REACH Revision still under discussion at the moment. According to Thorsten ZIEGLER the space industry has always been committed to REACH and will be in the future as well. But he is concerned whether the simplification objective can be achieved. Elisa CONSOLI added that the unpredictability also complicates investment decisions for the development of alternatives to restricted substances which is very costly. From the point of view of SMEs, Ralf BÖLTER said that they are on the one hand more flexible and faster in decisions to adapt to change given their size, on the other hand the magnitude and complexity of regulations (not limited to REACH) is very difficult to manage for them. Also, their budget may not be sufficient to do all the required re-qualifications. Premysl JANIK agrees that there is a strong need for funding, but private investors would rather invest in places where regulations are more easy to predict and they can expect a return for their investment.

Martijn BEEKMAN from the European Commission commented that indeed the REACH Revision is still under discussion, and the Commission proposal will be available by the end of the year. The message is clear in that REACH has to simplify, not only for authorities but also for industry.

Universal PFAS restriction proposal – Challenges to address it

A workshop participant asked whether there are any previous examples and important lessons learned where the space sector would have faced a similar restriction to the upcoming one on PFAS in Europe. Panellists agree that the universal PFAS restriction proposal poses unique challenges not encountered before. It is the first time that such a huge number of materials are affected and no complete mapping is available. Therefore a period of uncertainty in terms of PFAS-related obsolescence is ahead. By comparison, the case of chromates (authorisation) was a change as well but more focused in terms of technology and control over the companies' own surface treatment process, hence alternatives could be identified more easily. PFAS on the other hand are completely different, the space industry is buying articles which contain PFAS, buy off-the-shelf products such as sealings.

Another attendee suggested that given that the issue is not the end material but it is the manufacture, therefore the restriction should be to invest in preventing the pollution not getting rid of the technology. Elisa CONSOLI agreed that this is one of the aspects raised since the beginning. Work on the restriction has started several years ago, and we are a lot wiser today. A targeted approach would be best. But at the moment we still deal with the initial restriction proposal of the five national authorities, and ECHA cannot change it. Along the same lines, Martijn BEEKMAN from the European Commission commented that fluoropolymers are included in the restriction dossier, therefore the Scientific Committees of ECHA will assess the use of fluoropolymers.

Asked about third countries and how they follow the example of the EU on restrictions such as PFAS, Premysl JANIK referred to a report on PFAS from the U.S. which took a different approach.[5] Also other third countries take different approaches, as shown today for Japan (see JAXA presentation above under #10) and more broadly in a recent series of OECD webinars.[6] Europe appears to be most stringent.

On a positive note, Elisa CONSOLI remarked that research and mapping on PFAS are now underway. She considers that substitution is going to come, with an extra push from the restriction. This is a beginning and then the research will go on.

Cr(VI) substances – Change of industry response due to ECHA restriction proposal?
Panellists were asked about the remaining role of CR(VI) substances in their industries, and whether the planned transition from authorisation to a restriction based on limit values could lead to a comeback of Cr(VI).

Elisa CONSOLI said that these substances are not fully replaced yet, even after decades-long alternatives research. At the same time it would be very counterproductive to go back, as chromates have issues. The biggest uncertainty she sees at the moment is the transition from the authorisation to the restriction system.

Thorsten ZIEGLER commented that the Ariane 6 launcher is designed to be completely Cr(VI) free. However, challenges are remaining in the supply chain, with regard to the full substitution for procured items where his company doesn't have the full design authority.

Ralf BÖLTER added that most SMEs are not familiar with the Cr(VI) topic. Therefore there is no planning to go back to Cr(VI) when the authorisation changes to restriction.

One workshop attendee from the space industry cautioned that while going back to Cr(VI) is not a good solution, the alternative may be more energy consuming. There are lots of suppliers with two production lines, one for space and another for aeronautics. There is a question of stopping the line that is more energy consuming.

Another workshop attendee from the same industry highlighted that aeronautics (aircraft) and defence are more critical in terms of chromates (corrosion protection aspect) than space which is easier from corrosion resistance perspective.

Regulations other than REACH - Increase or pause on the regulations?
Finally, panellists discussed the issue of emerging regulations other than REACH.

According to Elisa CONSOLI this evolution presents both challenges and opportunities. Moving from REACH to regulations with a sectorial focus is an opportunity, but may present a challenge if it is not harmonized with the chemicals approach. As of today there is uncertainty about how all these laws play together. This also needs to be addressed within the European Commission. But we can get there.

Thorsten ZIEGLER complemented that in his view advantages and opportunities are much more than the challenges. As a point of concern he highlighted the risk of double regulation for the same substance, which should be avoided. He also expressed concern about the scope of additional environmental regulations, taking the example of the broad definition of "substances of concern" to be monitored and obsolescence risks. It could not be predictable nor manageable in terms of obsolescence.

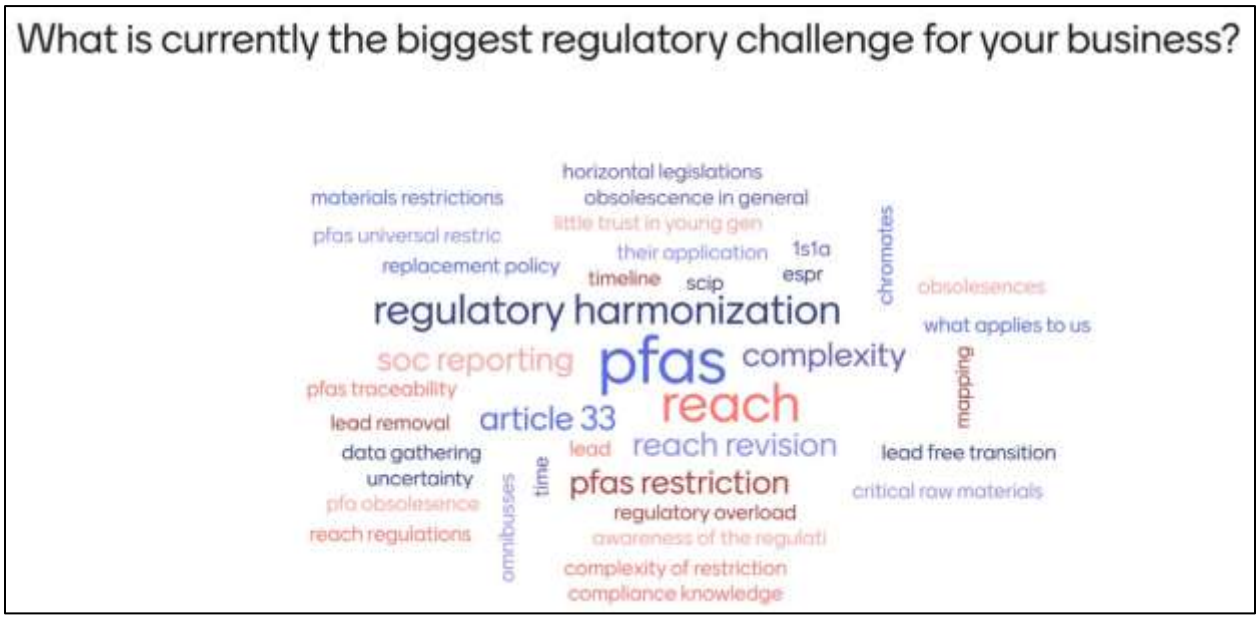
Ralf BÖLTER commented that for SMEs multiple regulations present a very challenging situation, given their limited resources. He suggested that REACH has to be streamlined, and the ESA REACH Tool could be expanded to get a status for different regulations.

[5] https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/03/OSTP-March-2023-PFAS-Report.pdf.
[6] See OECD webinars on PFAS of 11.12.2024 (covering Canada, the EU, Israel and Japan, link to contents) and 28.1.2025 (covering Australia, the UK and the Stockholm Convention, link to contents)

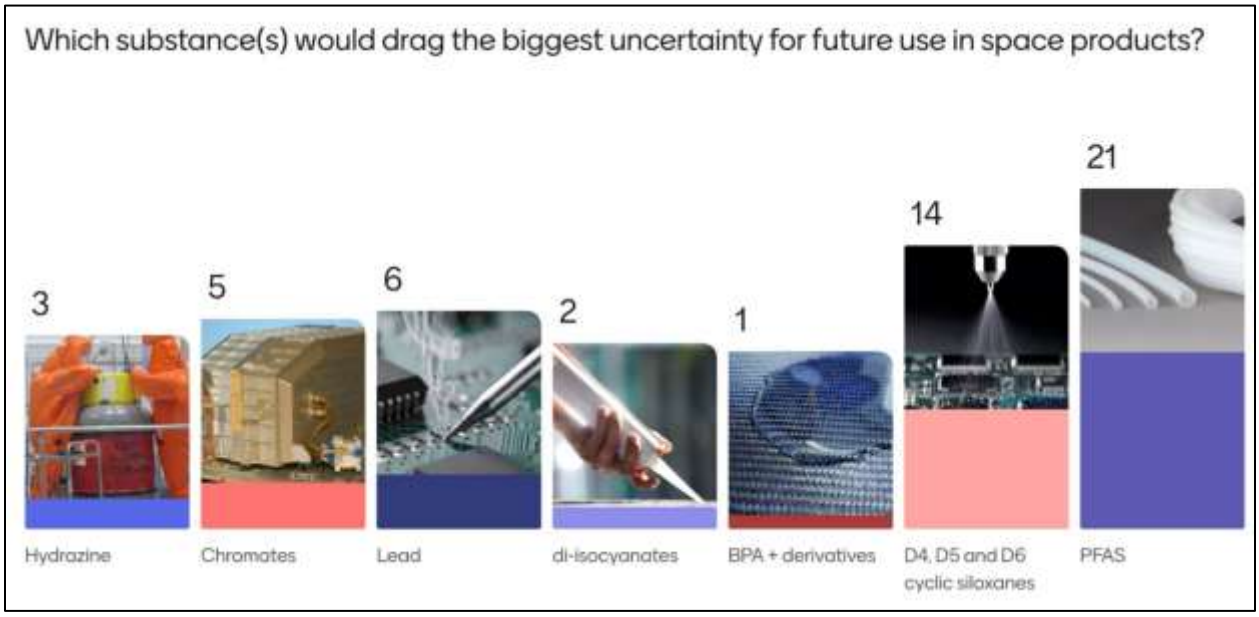
Premysl JANIK added that the ESA REACH Tool would not work without unity in the sector. If this can be strengthened, it will be possible to move much faster. Thorsten ZIEGLER complemented that tools are only as good as they are fed with correct data. The latter is a special challenge for "substances of concern" because there are no corresponding supply chain reporting requirements for this broad group. Before further environmental regulations, we need the mechanism first.

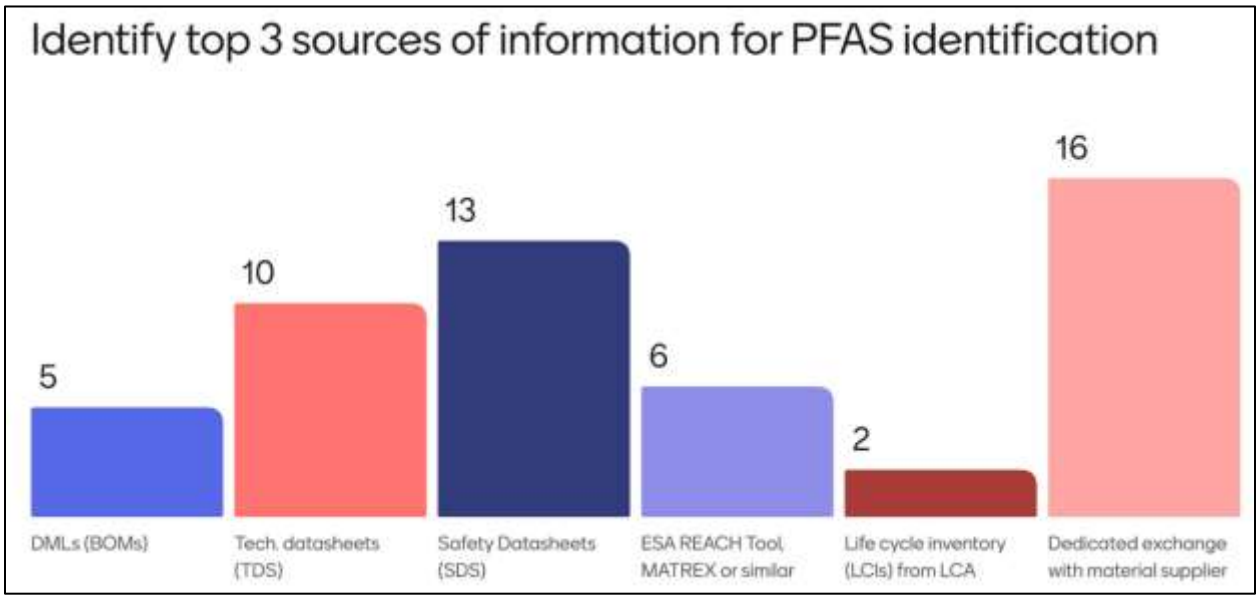
Attendee feedback

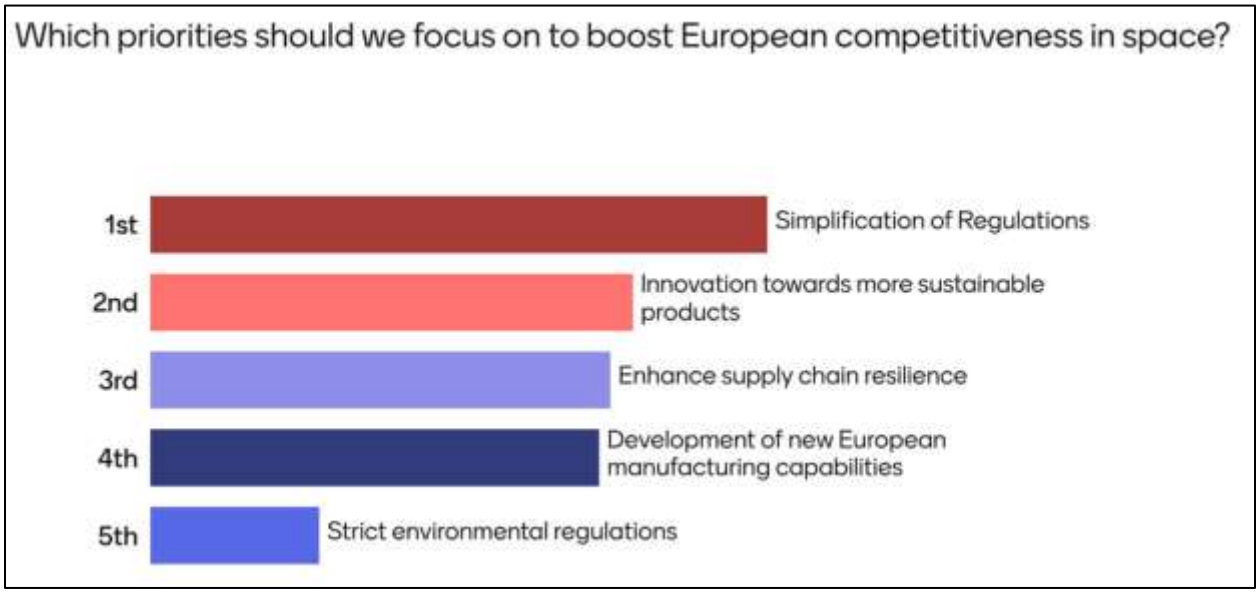
The real time Mentimeter responses (word clouds) by workshop attendees showed the following results:[7]



[7] Only surveys on regulatory questions are reflected. Attendee feedback also provided on workshop contents and suggestions for improvement will be taken aboard for future events by the organiser.


Which substance(s) would drag the biggest uncertainty for future use in space products?
3
5
6
2
1
14
21
Hydrazine
Chromates
Lead
di-isocyanates
BPA + derivatives
D4, D5 and D6 cyclic siloxanes
PFAS


Identify top 3 sources of information for PFAS identification
5
10
13
6
2
16
DMLs (BOMs)
Tech. datasheets (TDS)
Safety Datasheets (SDS)
ESA REACH Tool, MATREX or similar
Life cycle inventory (LCIs) from LCA
Dedicated exchange with material supplier



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- *Tim BECKER*, Senior Legal Advisor, E: tim.becker@reachlaw.fi

End of report