5th ESA REACH Workshop 2024 - Summary Report

On 19 June 2024, the European Space Agency (ESA) hosted the 5th edition of its ***"Workshop on the EU REACH Regulation and its impact on the Space Sector"*** at ESA ESTEC, The Netherlands.

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 (CCN1). For further details, reference is made to the Agenda and the individual Presentations.

Overview of the workshop

The main **objective** of this interactive full-day event was to raise once again awareness and discuss the current state of play, challenges, and risks with regards to **EU chemicals regulations (mainly REACH/CLP)** with experts from competent authorities, agencies and industry (including SMEs). The workshop came soon after the 2024 European elections (6-9 June 2024), which will also pave the way forward for actions related to the European Green Deal and the Chemicals Strategy for Sustainability, including the EU REACH Revision. Around 90 participants from 12 European countries were registered for the workshop.

The workshop, which was organised as a hybrid event, was composed of presentations with opportunities for questions and answers (**Q&A**) and a concluding expert panel discussion (see Table 1 below). Contributions were provided by representatives from the ***European Commission***, the ***European Chemicals Agency (ECHA)***, the ***European Defence Agency (EDA)***, ***ESA***, ***Centre National d'Études Spatiales (CNES)***, ***ASD-Eurospace***, ***LSI[1] industry***, ***SME (Small and medium-sized enterprises)*** as well as professional ***REACH experts***. The workshop was moderated by *Agustin Coello-Vera*, Senior Consultant at *REACHLaw Ltd*.

Table 1 Workshop Agenda

Time CEST	#	Speakers	Topic /Title
09:15-09:20	1	B. Schade (ESA, h/o TEC-Q)	Introduction & Welcome
09:20-09:50	2	P. Janik (ESA, REACH Officer)	ESA REACH Office – Introduction and space sector-wide initiatives
09:50-10:20	3	European Commission: J. Fabre (DG ENV) & M. Beekman (DG GROW)	European Commission update on the status of CSS actions, REACH revision, and key regulatory developments (focus on PFAS and Cr^{6+})
10:20-10:50	4	S. Doyle (ECHA)	Authorisation and Restriction – Updates from ECHA
10:50-11:15	BREAK		
11:15-11:45	5	A. Lesage (EDA)	REACH and Defence: Update from the European Defence Agency
11:45-12:15	6	T. Becker (REACHLaw)	Priority actions on EU REACH and issues of concern for the European Space Sector
12:15-12:45	7	M. Chaffardon (MT-Aerospace)	REACH Management within MT Aerospace
12:45-14:00	LUNCH BREAK		
14:00-14:30	8	M. Gabco (Invent + AKRK)	Regulatory challenges for SMEs
14:30-15:00	9	A. Coello-Vera (REACHLaw)	Lead-free Transition for the European Space Sector - LETTERSS project
15:00-15:30	10	E. Laurent + D. Faye (CNES)	Substitution efforts in CNES
15:30-16:00	BREAK		
16:00-16:45	11	Panel Discussion Panel composition P. Lionnet (Eurospace) J. Denzel (ADS) H. Waeterschoot (Eurometaux) P. Janik (ESA) Topics: 1. Supply chain challenges for European space sector -wider context, 2. Specific threats to industry (European capability vs. internal European regulatory constrains), 3. Specific REACH/Regulatory challenges… Q/A	Space industry association perspective Space industry perspective REACH expert perspective Space agency perspective
16:45-17:00	12	Closing remarks (organising team)	
17:00	END OF THE WORKSHOP		

[1] Large-Scale Integrator.

Presentations

#1	Britta SCHADE (ESA Quality Manager)	Introduction & Welcome

In her opening speech, Britta Schade from ESA stressed that safety and security are big priorities for her agency. At the same time, ESA is undergoing a significant transformation phase. With 81 missions running, the number has doubled while the workforce remained the same. Also, the transition to the new Ariane 6 launcher needs to be managed.

With its ESA Agenda 2025 (ESA Green Agenda), the Agency is increasing its contribution to combat climate change as part of the implementation of the Paris Agreement and the European Green Deal as well as enhance social and environmental responsibility.

In comparison to the previous 4th ESA REACH Workshop 2022 (all 17 presentations and a summary are available online), more room for discussion should be enabled this time, with opportunities for questions and answers after each presentation and a concluding panel discussion with REACH and space sector experts.

#2	Premysl JANIK (ESA REACH Officer) preparation supported by: Tim BECKER (Senior Legal Advisor at REACHLaw)	ESA REACH Office – Introduction and space sector-wide initiatives

At the outset P. JANIK highlighted that EU REACH is one of the most ambitious regulations and a main driver for change. It poses many challenges for niche applications such as those of the space sector. In addition to EU REACH, it is necessary to monitor chemical regulations in other ESA Member States (such as Switzerland and the UK) as well as in third countries (example of the U.S.).

Key objectives of the ESA REACH Office were introduced, including the support of ESA projects in REACH compliance and managing obsolescence[2] risks, as well as monitor future regulatory evolutions with potential impact on the space sector. The work is coordinated at a sectorial level as part of the Materials and Processes Technology Board (MPTB) chaired by the ESA REACH Officer, as well as a number of sub-groups dedicated to topics of special concern. Communication channels were outlined, stressing the fact that the MPTB is not only ESA, which merely has a coordinating capacity, whereas the "mouthpiece" for sectorial contributions and positions is ASD-Eurospace.

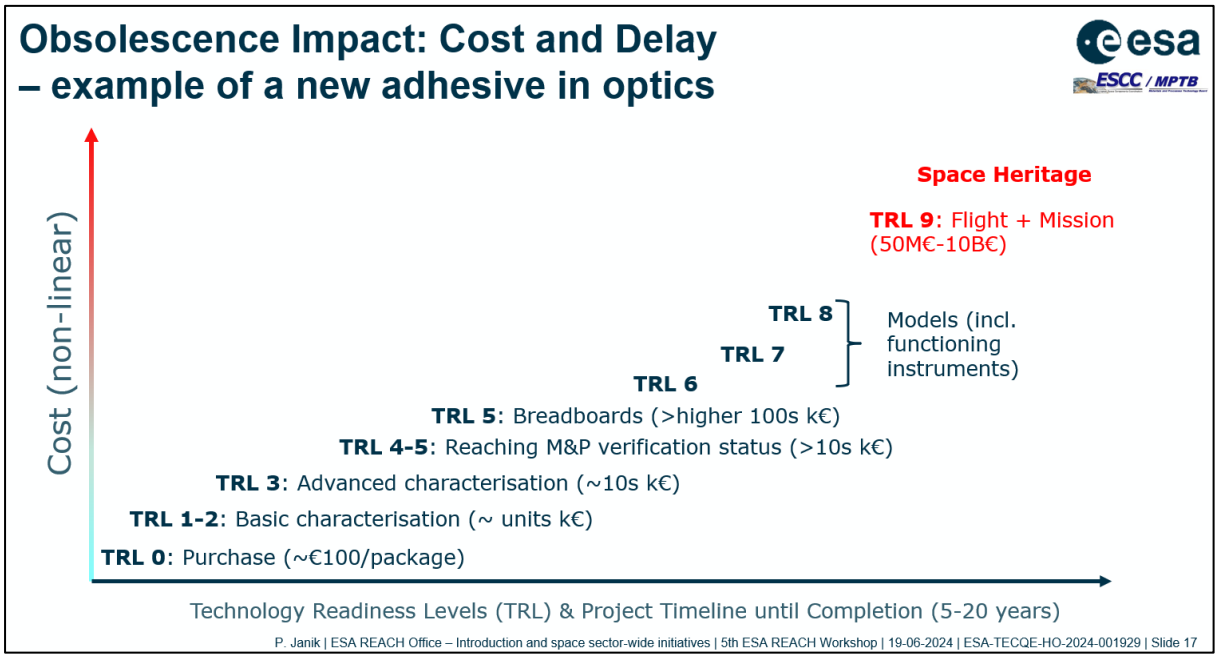
ESA also supports SMEs (some 2300 SMEs are registered with ESA) on REACH and started providing dedicated REACH awareness and ESA REACH Tool webinars in the beginning of 2024, with 100+ participants.

The impact of REACH on the space sector was shown through data from the ESA REACH Tool, and the criticality was apparent through the 200+ materials that are impacted by the REACH Candidate List, with the list gradually increasing. Without these materials, the space industry would struggle to survive.

Obsolescence risks were raised through the possible loss of heritage, and the economic impact associated with that. Space projects can cost several billion Euros, which are at risk from REACH obsolescence. The obsolescence impact in terms of costs and delay due to the very long development timelines was further illustrated taking the example of a new adhesive in optics which has to pass a sequence of Technology Readiness Levels (TRLs) to be finally flight-proven and fit for a given mission, e.g. space telescope (see Figure 1 below).

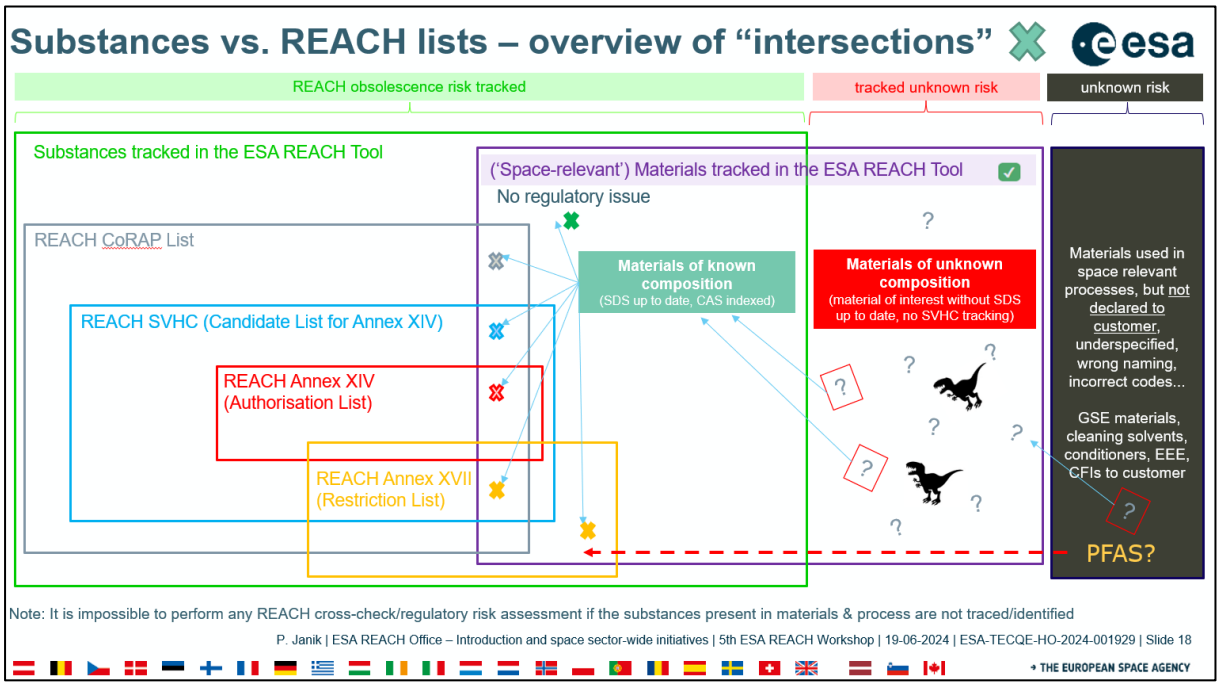
[2] Obsolescence can be defined as the transition from availability to unavailability of a material, mechanical part or process from the manufacturer or supplier (as per ECSS-Q-HB-70-23A).

Figure 1 Cost and delay for introduction of new space materials



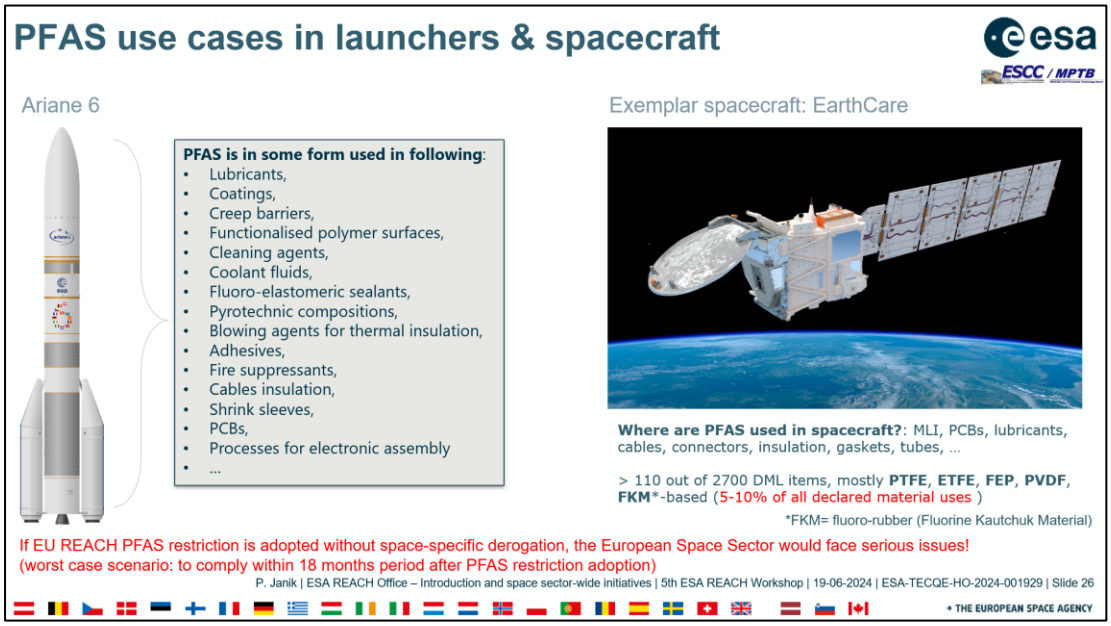
An overview of intersections of substances vs. REACH lists was presented, including the case of PFAS, which would move from an "unknown risk" – as not all PFAS substances have a CAS Number that can be tracked or are not declared in safety data sheets or other product information – straight into the restriction intersection (Figure 2 below).

Figure 2 Substances tracking in the ESA REACH Tool and unknown risks



Regarding the "universal" PFAS (U-PFAS) restriction proposal under EU REACH P. JANIK recalled the broad scope in terms of substances (>10,000) and use cases (including presence in articles/assemblies), the immediate obsolescence effect (example of 3M, see news alert of 20 December 2022) and the European Space Sector comments (MPTB-ES-PO-0131) submitted to ECHA for its public consultation on the restriction proposal in 2023. He also provided an illustrative overview of PFAS use cases in launchers and spacecraft (see Figure 3 below), stressing that safety and reliability are the top priority Number 1 and the criticality of fluorinated substances to this end.

Figure 3 PFAS use cases in launcher & spacecraft



As a conclusion, the U-PFAS restriction proposal as it currently stands is considered to be unmanageable.

Furthermore, P. JANIK touched upon the challenge of cyclic siloxanes (D4, D5, D6) and parallels with PFAS, in particular the issue of the invisibility of use, as the use in producing silicones is not necessarily reflected in supply chain communication.

Finally other EU regulatory initiatives were briefly presented. A notable point included the perceived incoherence as regards the treatment of space products in different regulations, whereas in some cases a space sector reference is being added without a proper understanding of the sector specificities.

Overall, the current EU regulatory framework is considered to be most complex.

Q&A P. JANIK was asked if he has noticed a change from European authorities over the past four years with respect to Space. P. JANIK responded that he does not really have that impression. ESA is in a predicament where it is not an EU agency, nor can it interact seamlessly with EU regulators. This is in sharp contrast to the U.S. where NASA can feedback better to U.S. regulators. It gives a bad signal to investors in European space industry materials, who cannot rely on EU support of the sector. In the EU there is an approach to ban uses, whereas there are no suitable alternative solutions. He gives the counter-example of the U.S. where the Department of Defense (DoD) has been able to flag critical uses for aerospace and defence for the ongoing work on PFAS (link to DoD report of August 2023). Space is really a special case, and with the direct monetary impact of space activities alone it is difficult to convince regulators that Space is an important sector. In terms of numbers the sector is small and can often be overlooked in chemical regulatory decision making.

#3	European Commission: Julien FABRE (Policy Officer, DG ENV) – *online* Martijn BEEKMAN (Policy Officer, DG GROW) Fabio VITOBELLO (DG DEFIS) – *not attending*	**Commission update on the CSS and recent developments – Chemicals Strategy for Sustainability, REACH, PFAS, Chromium (VI) and lead**

The presentation combined three presentations from the speakers and Fabio Vitobello (DG DEFIS).

M. BEEKMAN introduced the presentation by stressing that the space sector comments are being heard, also those in the ECHA public consultations.

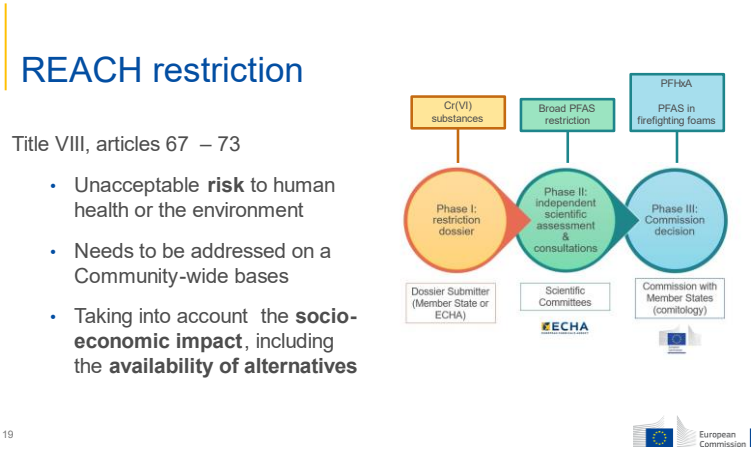
In the first part J. FABRE pointed out that under the previous mandate of the European Commission, there was a European Green Deal and a Zero Pollution ambition. He provided an update on the Chemicals Strategy for Sustainability (CSS). He highlighted the progress on the revision of the CLP Regulation, including the addition of new hazard classes as part of a Delegated Act and a legislative proposal, and the Commission communication on the Essential Use Concept (EUC) of April 2024, which is an important deliverable of the CSS.

He further elaborated on the "One substance one assessment" package, which is a response aimed at the current plethora of regulatory processes (> 100 pieces of EU legislation dealing with chemicals) managed by multiple stakeholders (COM, EU agencies, Member States, Industry) and at different times, in order to consolidate, better synchronise, coordinate and to an extent harmonise the implementation. The aim is also to improve transparency and as part of this, data should be shared and reused by default, including through a Common Data Platform.

Regarding the Commission Communication (C(2024)1995 final) adopted 22 April 2024 on Guiding criteria and principles for the EUC in the EU legislation J. FABRE highlighted the purpose of the Communication, the aim of the EUC such as a faster phase-out of non-essential uses of most harmful substances and the cumulative nature of the essential use criteria. He stressed that the introduction of the EUC in a particular legislation would be done only after a prior Impact Assessment. In the meantime, for business, even though the Communication does not have legal effect for the moment, it would provide clear signals on where investment and substitution efforts shall be directed as well as incentives for more research and innovation into safer and more sustainable alternatives for the most harmful substances.

In the second part covering PFAS, Chromium(VI) and Lead, M. BEEKMAN introduced the 3-phases of the REACH restriction process: Restriction dossier (Phase I), independent scientific assessment and consultations (Phase II), finally the Commission decision (Phase III). Cr(VI) substances are currently in Phase I, the U-PFAS restriction proposal in Phase II and some targeted PFAS-related restriction cases in Phase III (PFHxA – about to be adopted, PFAS in firefighting foams) – see Figure 4 below.

Figure 4 REACH Restriction: Overview and three phases



Regarding **U-PFAS**, M. BEEKMAN stressed that all the comments need to be assessed very carefully, ECHA does this in batches. The Commission role is currently to follow the opinion-making as an observer in RAC and SEAC Committees at ECHA. The Commission envisages that there will be derogations for **critical uses where no alternatives are currently available**. It will also be important to **minimise emissions of PFAS in the entire life cycle** for any use that is derogated.

Regarding **Cr(VI) substances under REACH**, the **authorisation** scheme still applies today, but it has resulted on a heavy burden and an important backlog in authorisation decisions by the European Commission. Regarding the annulled 'Chemservice' upstream authorisation (also known as 'CTACSub') including 'use 4': use of chromium trioxide in surface treatments in aeronautics/aerospace industries, it is clarified that **uses covered by the annulled decision are still allowed until a new COM decision is taken**. Regarding the ongoing ADCR and CTACSub2 upstream review reports and new applications under evaluation by ECHA, M. BEEKMAN stressed that the Commission will be committed to provide legally robust decisions as soon as possible.

Given the above mentioned burden and backlog, the Commission observed that the authorisation approach for regulating Cr(VI) substances may no longer be the most appropriate to control the risk to human health posed by these substances, and therefore asked ECHA to prepare a **restriction** dossier (by April 2025). ECHA is currently holding a Call for Evidence (June – August 2024) as part of the preparation of the dossier. It is noted that the participation of aerospace/defence industry in the 1st Call for Evidence (Q1 2024) was very limited; stakeholders are encouraged to provide information on their uses. If all goes well, this restriction could be adopted by the end of 2026. Once the Cr(VI) restriction will enter into force, the authorisation obligation will be withdrawn for substances covered by the restriction. In the meantime, ECHA and the Commission continue to treat applications for authorisation for Cr(VI) substances and conditions of current authorisations remain applicable.

Regarding **lead**, it was clarified that the Commission is not obliged to follow the ECHA recommendation and **does not intend to include lead in the authorisation list**, as it would also create an unmanageable process like with Cr(VI). As part of the EU Call covering Critical Space Technologies for EU non-dependence, in 2022 and 2023 DG-DEFIS has opened a call for projects focused on replacement solutions for metallic lead (Pb) used in solder paste, assembly, finishings, terminations. The project LETTERSS has been selected and kicked-off (see also presentation #9 below by *A. COELLO-VERA*).

Q&A How is the EUC planned to be implemented for EU REACH? COM cannot reply. The REACH Revision is currently on hold and guidance is awaited from the new Commission.

J. DENZEL from Airbus Defence & Space commented on the COM presentation that the burden for industry (not only authorities) should not be forgotten, e.g. when it comes to Cr(VI) authorisation. He added that maybe targeted restriction is the better option especially in cases with a higher number of different uses like for Cr(VI) and lead. The COM (non-)intention regarding lead's Annex XIV inclusion is acknowledged.

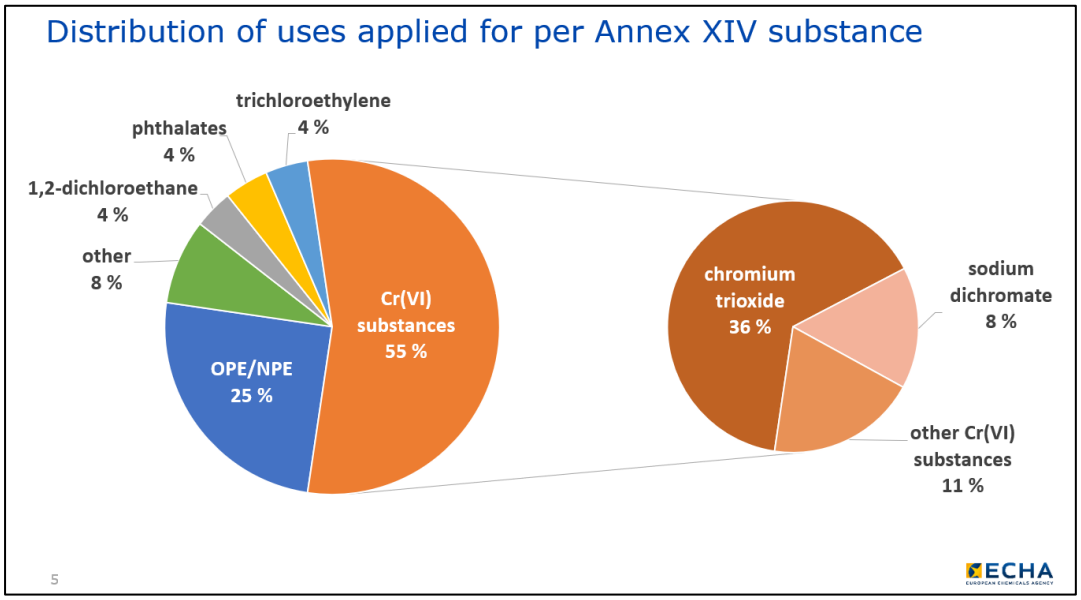
J. DENZEL also questions the basic assumption of the CSS that replacement would be possible without a performance loss; it's not only a question of money and time.
- J. FABRE replies that the perfect alternative does not exist. Performance does not need to be strictly the same, in terms of performance, but the alternative should be acceptable from a societal point of view. Human health and environmental consequences of using most harmful substances should be kept in mind. A balance needs to be found, e.g. as part of enacting restrictions.

#4	Simone DOYLE (Head of Risk Management I unit, ECHA)	ECHA update – Authorisation and Restriction

In the first part, S. DOYLE provided a return of **experience with applications for authorisation (AfAs) so far, focusing on Cr(VI) substances**. ECHA have received AfAs for a bit more than half of substances in Annex XIV. Over half of submissions are for Cr(VI) substances (55%), thereof 36% for chromium trioxide (see Figure 5 below). Over

time since 2013, there have been different waves of applications, with a Cr(VI) peak in 2016 and a resurgence in Cr(VI) AfAs/review reports in 2023.

Figure 5 Breakdown of applications for authorisation per substance, focus on Cr(VI) substances



In her second part, S. DOYLE elaborated on ECHA's **preparations for a restriction proposal on certain Chromium(VI) compounds** (*see already above under #3 COM presentation*). ECHA has received the initial Commission mandate on 27 September 2023, which was to cover at least Chromium trioxide (entry 16 of Annex XIV) and Chromic acid (entry 17 of Annex XIV). The 1st ECHA Call for Evidence (ended on 27 February 2024) (> 600 responses received) focussed on the most likely response of companies to different scientific limit values and the costs associated with meeting them. In May 2024, the Commission extended the scope to cover more Cr(VI) substances listed in Annex XIV and based on specific considerations (incl. regrettable substitution, enforceability, etc.). Currently the 2nd ECHA Call for Evidence based on the extended scope is on-going. On top of the same questions of the first call for evidence, the second call also includes a separate survey on alternatives.

Finally, S. DOYLE provided an overview of **ECHA's new tasks under the Batteries Regulation (EU) 2023/1542**, which entered into force on 17 August 2023. Article 6 foresees the possibility of restrictions of substances in batteries if there is an unacceptable risk to human health or the environment (REACH-like approach). According to Article 6(5), the Commission, assisted by ECHA, shall prepare a **report on substances of concern (SoC) in batteries**. The Commission shall submit that report to the European Parliament and to the Council by 31 December 2027. The report should cover substances present in batteries or used in their manufacture, and it must contain considerations on follow-up measures, including restriction. ECHA's goal is to deliver its report to the Commission by the end of 2026. A study has been outsourced to a contractor under ECHA's supervision. Phase 1 (by June 2025) of the study is ongoing, with a **mapping** of substances and processes. Phase 2 (by December 2026) will elaborate a list of **substances of concern** and **prioritisation** to be delivered to the Commission.

Q&A S. DOYLE confirms that ECHA will look at the SoC definition under the upcoming Ecodesign for Sustainable Products Regulation (ESPR) when elaborating its report under Article 6(5) to the Commission.

Hugo WAETERSCHOOT (Eurometaux) comments that the scope is broad on batteries, and there is a collection in a questionnaire of specific substances used. He urges the audience to highlight the substances used in the sector.

Tim BECKER (REACHLaw) recalls that the Batteries Regulation does not apply to batteries that are incorporated into or that are specifically designed to be incorporated into equipment designed to be sent into space (Article 1(5)(b)). This may at least limit the impact on the sector.
Axelle DELAGOUTTE (Airbus Defence and Space) is concerned that it is difficult to have multiple definitions for substances of concern. She stresses that we need a harmonised definition. ECHA replies that the concerns are heard, they may be more a point for the Commission.

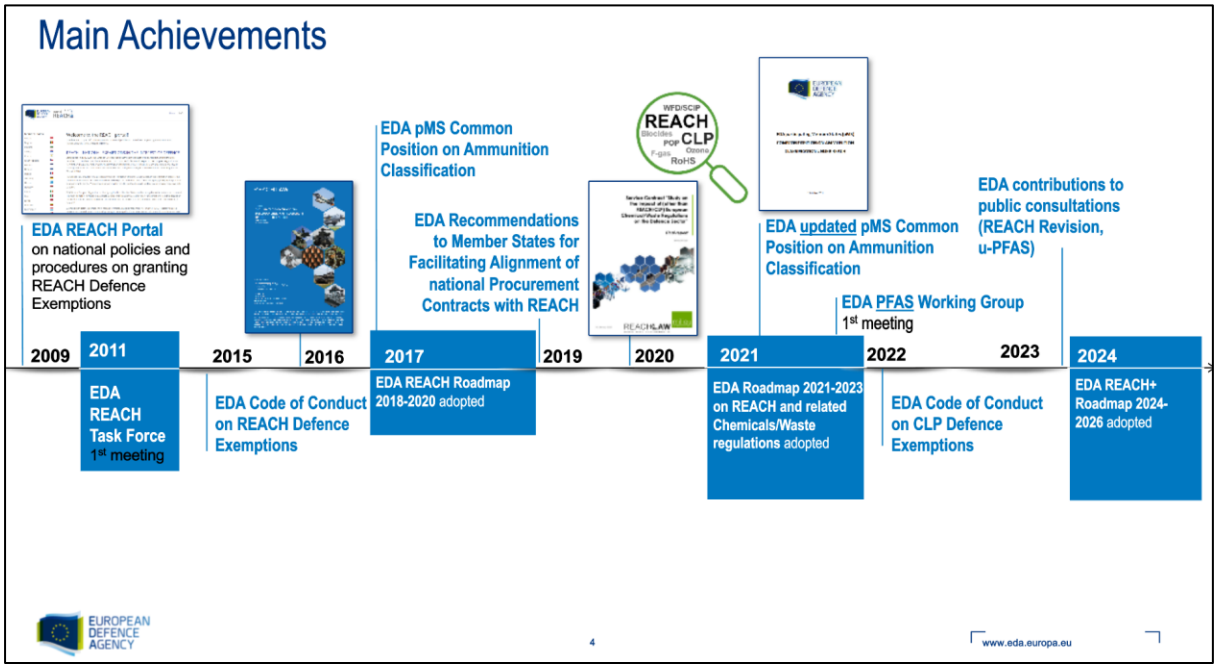
Christian PUIG (Airbus Defence and Space) asks what are the links with conflict materials and recycling batteries? ECHA replies that these are examples of new connections that need to be made. Currently ECHA is in a capacity building phase, as other actors had tasks under the previous Directive.

Agustin COELLO-VERA (REACHLaw) asks whether lithium is a potential SoC in batteries. ECHA replies that it could be a potential one and will be part of the scoping study. Lead and cadmium are already restricted for some batteries.

#5	Alexandra LESAGE (Project Officer REACH, EDA)	REACH and Defence: Update from the European Defence Agency

A. LESAGE recalled the central role of the EDA in defence-related REACH+ matters since 2009, providing a forum for structured dialogue with key stakeholders, including COM, ECHA and ESA as partners. Participating countries include all 27 EDA Member States plus Norway. The **EDA REACH Task Force** comprises REACH/defence experts from 11 Member States and Norway supporting EDA's work at a technical level. A. LESAGE showed a timeline with the main achievements (see Figure 6 below).

Figure 6 EDA REACH+ Activities – Main achievements since 2009



On **PFAS** EDA has been working since 2019, raising awareness and assessing possible impacts of restriction initiatives on defence, first with a focus on firefighting foams and then through mapping of other uses in the defence sector. An **EDA PFAS Working Group** was set up in 2021; it comprises 12 Member States, Norway and ad-hoc participation from other Member States. A summary of EDA input to the U-PFAS ECHA public consultation was provided, stating that a defence exemption would not be enough; it concludes that it is crucial that the

universal PFAS restriction proposal includes **sufficient transition periods** for research, testing and implementation of viable alternatives for defence uses at EU level, as well as relevant **derogations where necessary**.

This year, the new **EDA REACH+ Roadmap 2024-2026** has been adopted. The scope of the Roadmap is not limited to REACH as it includes also topics such as Essential Use, F-gas, R&T Substitution, POP and RoHS. The Roadmap now includes three pillars:

1. Ensure common understanding and coherent implementation by Member States
2. Assess and mitigate REACH+ impacts on Defence
3. Strengthen EDA's role in Defence-related REACH+ matters

A. LESAGE further elaborated on the close **EDA interaction with ESA on REACH**, which is very meaningful because Defence and Space are niche sectors sharing common topics of interest and challenges on REACH. EDA appreciates its participation as an observer in MPTB activities chaired by ESA.

As a **conclusion**, EDA is supporting the continuous effort of Ministries of Defence to comply with REACH+ regulations while maintaining the operational effectiveness of the EU Armed Forces. The exchange of information on regulatory developments within different sectors is crucial to identify direct and indirect impacts. The potential impacts stemming from the restriction proposals on PFAS and Chromium(VI) substances are of major concerns for the European Defence sector. EDA maintains close coordination with all involved stakeholders at EU (COM, ECHA, ESA, EU industry associations/ASD) and national (Member State Competent Authorities, National Defence Industry Associations) levels.

#6	Tim BECKER (REACHLaw, Senior Legal Advisor)	Priority actions on EU REACH and issues of concern for the European Space Sector

T. BECKER aimed to reflect on important recent and on-going EU REACH-related activities in the European Space Sector and issues of concern for the sector, building on what was already said by previous speakers.

At the beginning T. BECKER recalls that the sector is operating in a very complex and fluid regulatory environment which needs to be constantly follows. Examples presented include the ECHA Integrated Regulatory Strategy, the REACH restriction process and the Commission's Chemicals Strategy for Sustainability. Now we also have to take into account the European Elections that were held at the beginning of June 2024. It remains to be seen what the outcome will mean for the future of the European Green Deal, the further implementation of the CSS and in particular the REACH Revision.

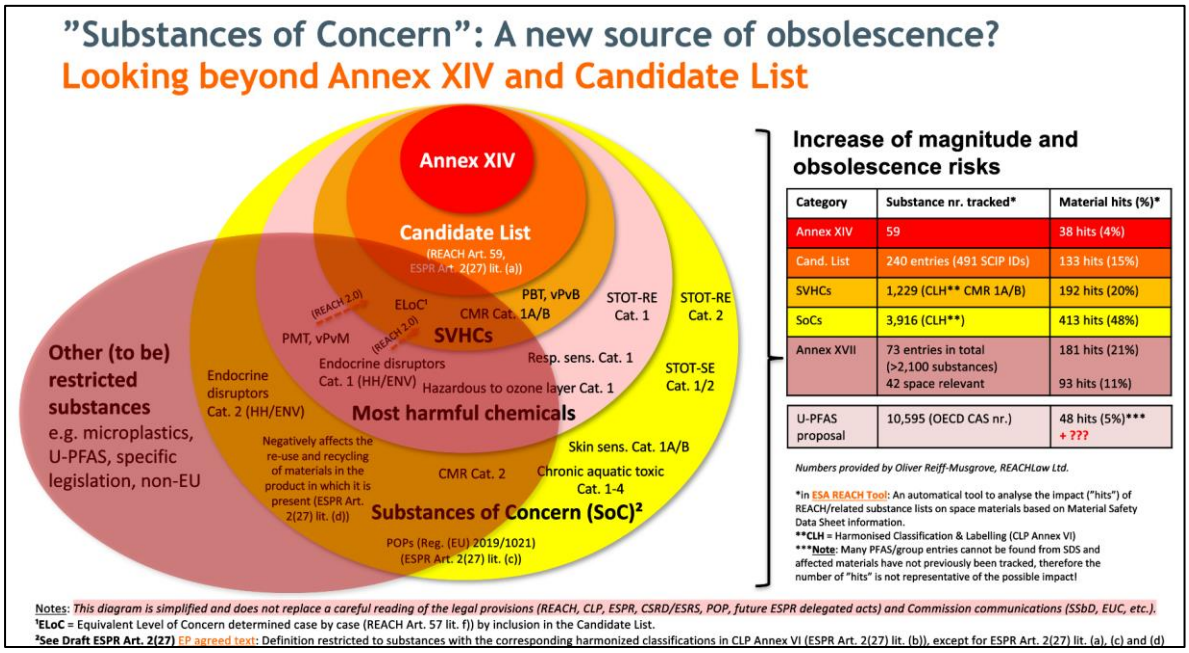
On **U-PFAS** he provides an updated timeline that cautiously estimates an adoption of the restriction in 2027. Sectors of PFAS applications and groups of key interest to the space industry highlighted. With regards to the Eurospace contribution to the ECHA public consultation in 2023 it was determined that space applications would mainly fall in the category of "niche applications" or "uses (yet) unknown" at the time of the initial restriction proposal. Overall close to 70 space application use cases of common interest were identified, most of them without an existing derogation proposal in the restriction dossier. This would mean that these uses could be effectively banned before 2030 unless derogations are still added to the proposed restriction entry. The key requests according to the Eurospace comments are to exclude fluoropolymers from the scope, a sectorial derogation for equipment designed to be sent into space and further derogations as necessary to maintain a business viable market for space suppliers.

On **Cr(VI) substances** T. BECKER notes that their use in the Space Sector has decreased in the last decade, but it is still relevant, especially at subcontractor level. The situation remains very complex, cumbersome and resource-intensive, now with the concurrent activities on authorisation (in force) and restriction (under preparation).

Regarding the Commission's **Essential Use Communication** of April 2024 he deplores that the assessment process looks rather complex for essential uses and there is no provision for fast-tracking clearly essential uses, which was a main request from the European Space Sector. Regardless of this lacking provision, it is understood that the

Commission would like to enable fast tracking of essential uses as part of an EU REACH Revision, to reduce the burden on industry too. In addition, T. BECKER lists a number of other questions yet to be answered in practice, to make the EUC operational. In particular, he is of the opinion that implementing lower performing alternatives is not something that can normally be acceptable given the investments and benefits of space activities at stake. T. BECKER then continued to show that the **new concepts of "most harmful chemicals", "substances of concern", together with other (to be) restricted substances** significantly increase the magnitude of impact and obsolescence risks for the European Space Sector, as exemplified using the material "hits" in the ESA REACH Tool (see Figure 7 below).

Figure 7 New "substances of concern" and others in the regulatory radar



The table shows that whereas about 15% of space materials in the tool are affected by current REACH Candidate List entries, close to 50% would be impacted by the Substances of Concern definition (CLP hazard classes alone)! With regard to PFAS it must be stressed that the impact from the U-PFAS restriction initiative in terms of hits in the ESA REACH Tool must be seen as a clear underestimate, as we don't have all the data from SDSs and the REACH Tool is itself only a snapshot of all materials used in the Space Sector.

Regarding the **CSS REACH Revision** currently on-hold, T. BECKER recalled the benefits of **stability** of the current REACH Regulatory system, including the Candidate List as a cornerstone, but also aiming for **targeted changes** as part of a future REACH Revision that would contribute to **burden reduction, simplification and more legal certainty for the European Space Sector**, especially as part of the Authorisation and Restriction Reform. The detailed European Space Sector Position on the CSS REACH Revision was communicated to the Commission in April 2022.

Finally, T. BECKER mentioned the recent priority action of an impactful change agreed at United Nations level regarding the **transport of hydrazine anhydrous under UN number 2029** in the Dangerous Goods List. European space companies could no longer use current pressurised vessels for the transport of hydrazine anhydrous, and alternatives in line with PP5 provision are lacking. This issue was apparently overlooked in UN discussions. This case shows that non-REACH regulatory topics that are presenting a concern for the European Space Sector are addressed as well.

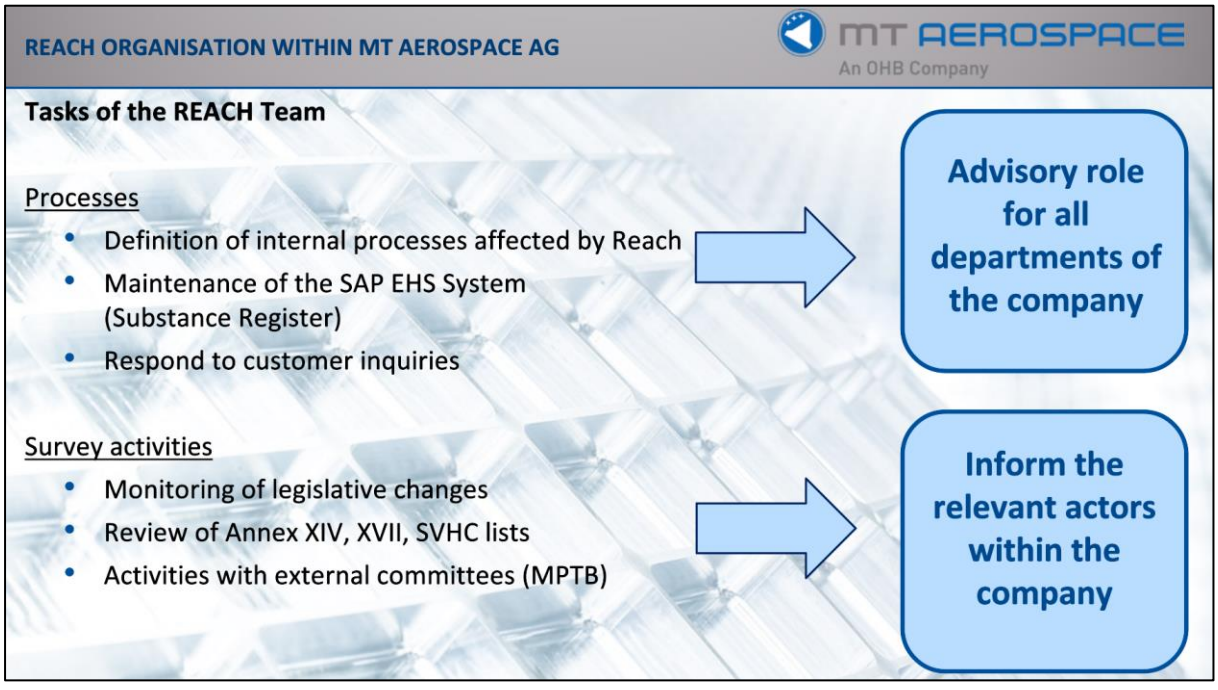
To conclude, T. BECKER summarized that addressing chemical regulations is a hybrid and constantly evolving challenge. EU REACH and the European Green Deal have prompted an unprecedented wave of regulatory initiatives to improve chemical safety and sustainability, and complexity is ever increasing. The required response by industry and end users is no longer limited to compliance, but must start well ahead of legally binding requirements. In this regard, and despite our best efforts in the European Space Sector, space applications still tend to be overlooked by regulators. The large scope and increasing duration of "catch-all" regulatory restrictions (example of U-PFAS and chromates) creates uncertainty for businesses while significant resources are spent by all involved. Therefore he recommends more focus on the real priorities, such as the protection of consumers while preventing over-regulation for safe and clearly essential uses.

Q&A COM/ Martijn BEEKMAN asks how the Eurospace request of having *"further derogations to enable space chemicals and component suppliers to maintain a business viable market in the EU for aerospace and defence, electronics and related sectors"* can be justified. T. BECKER replies that reference is made to this end in the Eurospace paper to other industry contributions, e.g. the U-PFAS contribution by ASD. P. JANIK adds that the space industry are niche users of finished products, so don't have power to influence the market in chemical production. Therefore, Space needs the market of many COTS (Commercial Off The Shelf) products including materials, to have a solid base of material manufacturers.

#7	Manuelle CHAFFARDON (MT-Aerospace)	REACH Management within MT Aerospace

MT AEROSPACE AG is an international company active in the fields of space transportation, defense and components for satellites and aircrafts. The company is affected by REACH at different levels. Hence its REACH Team consists of a Project Lead and Material Development, Procurement and Engineering functions; it reports to the EHS Manager. The tasks of the REACH Team are reflected in Figure 8 below.

Figure 8 Tasks of the REACH Team within MT AEROSPACE AG



The company maintains an **Obsolescence List** which collects alerts from the supply chain and identifies which projects are affected. The **SAP EHS System** contains a Substance Register based on CAS Number.

Some common affected processes are highlighted: Chrome VI and Cadmium for surface treatment. Further topics of concern include diisocyanates (exposure measurements), D4-6 cyclic siloxanes, Bisphenol A (prepregs, resins) and PFAS.

M. CHAFFARDON explained that small quantities are ordered and it is difficult to get reliable information from the suppliers. In addition, only having one or two suppliers in several cases also reduces flexibility, and there is dependence on supplier strategy.

Substitution activities are difficult due to the high requirements in the aerospace sector and the very long qualification times due to complex processes.

M. CHAFFARDON concluded that the space sector is well aware of the importance of the REACH Regulation to ensure the safe use of chemicals both for the human health and the environment. Her company has defined processes and tools to ensure compliance. She believes it is necessary to get a full recognition of the specificities of this strategic sector with critical and high requirements, including through **exemptions for space and defense** and **simplified derogation processes**. It is also important to ease the monitoring activities with **transparent SVHC substance definition with CAS numbers**.

Q&A H. WAETERSCHOOT from Eurometaux comments that there may be no requirement to choose lower performance substitutes for functional uses, citing two recent cases in ECHA's SEAC Committee.

P. JANIK asks about the usefulness of the ESA REACH Tool. M. CHAFFARDON replies that it is indeed very useful, however a lot of materials are not in the tool today. Her company's register includes almost 700 products.
Asked about the level of attention of top management for REACH related problems, M. CHAFFARDON replies that it is very difficult. REACH compliance is not a productive aspect, but of course the law has to be complied with. It helps that a REACH Team has been built to create awareness and it tries its best to communicate.

#8	Michal GABCO (Product Assurance Manager at INVENT GmbH & AKRK representative)	Regulatory challenges for SMEs

Invent is an independent SME, founded in 1996 as DLR spin-off in Braunschweig, Germany. It is active in the development and production of innovative lightweight structures for the space and aviation industries and has around 100 employees today.

AKRK (Arbeitskreis Raumfahrt KMU) is a German SME association for space flight, comprising about 45 SMEs which represent about 2,000 employees. The portal of AKRK-SME is available at www.best-of-space.de. AKRK is nowadays also an observer of the MPTB.

M. GABCO shared that most of the SMEs part of AKRK responding to a REACH & SCIP awareness questionnaire are aware of the **REACH** Regulation, but only 50% are trying to figure out the steps towards compliance. The majority of companies responding to the survey are users and not manufacturers of the materials, thus rely on information from their suppliers. By contrast, only 25% of survey respondents are aware of the **WFD/SCIP** requirements; those who are aware that they have a SCIP notification duty do not know the further process to prepare and submit to the SCIP Database.

M. GABCO shared a number of examples of open questions with regard to REACH, lacking supplier responses and acceptable alternatives. The example of BR127 (strontium chromate) was highlighted.

In terms of SME challenges, M. GABCO highlighted that SMEs typically don't have a dedicated REACH officer or REACH team. Actually SMEs don't need to monitor every tiny change in legislation, they are interested in what will impact them and what exactly do they need to do to comply. The ECHA website can be overwhelming and is

not intuitive for engineers. Therefore, information about events / information sources for development engineers would be welcome. Also, tools such as REACH-IT / IUCLID, ESA REACH-Tool, ESA MODESA DB, MATREX still have low visibility (at least within AKRK).

M. GABCO deplored the low SME response rate to the REACH & SCIP awareness questionnaire for AKRK Members and stressed the importance of proactivity towards obsolescence.

Q&A Pierre LIONNET from ASD-Eurospace commented that he felt reminded of the early days of REACH with prime contractors which at that time were in a sort of "denial mode" faced with conflicting engineering choices and habits. Thanks to the continuous support from ESA, this situation has changed ever since. But what may be addressed as a concern by bigger industries today, can be a showstopper for smaller companies.

Thorsten ZIEGLER from ArianeGroup concurs that the replies presented by M. GABCO are the same as the answers his company gets from the supply chain. He is very worried about the identification of "most harmful chemicals" and "substances of concern" due to the lack of traceability within the supply chain. It is already difficult to identify Candidate List substances in articles.

Premysl JANIK adds that there is a lack in the digital infrastructure for REACH and calls for a Commission system creating a freely accessible database for Safety Data Sheets (SDSs), which would be fed by the chemicals manufacturers and formulators. Otherwise there will always be dependence on third parties providing this information subject to costs and SDSs need to be reviewed.

Josef DENZEL from Airbus Defence and Space concurs with the previous speakers that for SMEs it is a topic of survival if one is not prepared for a risk assessment. He cites the case of an Annex XIV lead oxide company with 200 people which was close to closure due to lacking authorisation, but was saved by a defence exemption. (Such possibility does not exist for civilian space applications.)

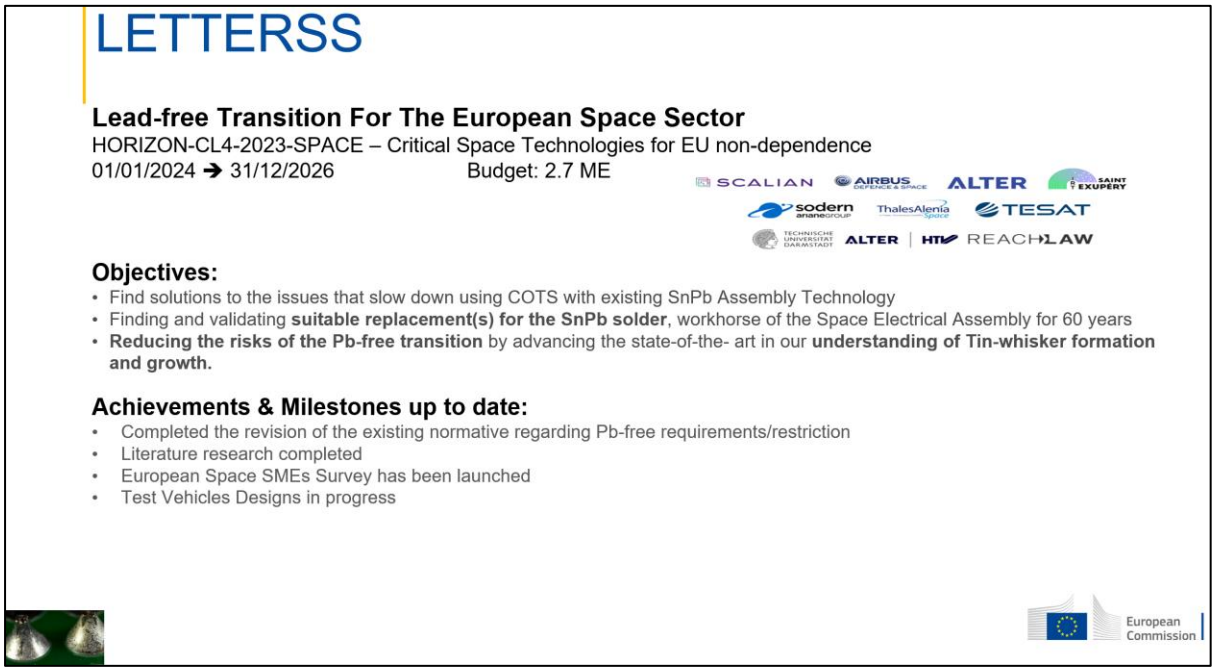
#9	Agustin COELLO-VERA (Senior Advisor, REACHLaw)	Lead-free Transition for the European Space Sector (LETTERSS): A new EU-funded R&D project

A. COELLO-VERA started by explaining the background. Space equipment has been out of scope of the RoHS Directive since 2003 and management is typically not willing to invest in something not improving performance. However, the inclusion of metallic lead into the REACH Candidate List of SVHCs for Authorisation triggered the elaboration of a Roadmap for Lead-free Transition in the European Space Sector by a MPTB/CTB Joint Task-Force on Pb-free transition in April 2020. The Roadmap was delivered to all funding bodies, including the European Commission. In 2023, LETTERSS was finally retained and funded by the European Commission under Horizon Europe with an amount of 2.8 million Euros.

A. COELLO-VERA then provided an overview of the LETTERSS project (see also Figure 9 below).

The project started on 1 January 2024 and has a scheduled duration of 36 months. LETTERSS is a consortium of 11 Partners including industrial end users, equipment manufacturers, service providers, a research institute and a university. The implementing EU agency is the Health and Digital Executive Agency. The project also established an Advisory Board with ESA and other agencies' participation. A core objective of the project is to evaluate two existing solders to replace tin-lead solder, which has been the workhorse of the Space Electronic Assembly for 60 years. Tin-lead soldering is a very low technology activity but is very vital in satellites. The state of the art in the understanding of tin-whisker formation and growth should also be advanced, as there is no consensus within the Space Sector today on the risk due to whiskers. Reported failures due to whiskers are displayed.

Figure 9 LETTERSS project and status at a glance



Further information on the LETTERSS project is available at https://letterssproject.eu.

Q&A Asked about the two solder pastes to evaluate, A. COELLO-VERA replies that SAC305 (*SAC alloys are based on Tin, Silver and Copper*) has enough promising data, but the other is not selected yet; there is a year to choose.

#10	Elisabeth LAURENT (M&P engineer, CNES) Delphine FAYE (Laboratories & Expertise Department, CNES)	Substitution efforts in CNES

CNES provided a two-part presentation to (1) outline the agency's actions to handle the REACH Regulation at Materials and Processes level and (2) describe substitution R&T activities to support French industry.

CNES actions to handle the REACH Regulation at Materials and Processes level include risks anticipation and management (e.g. through MATREX, the internal CNES materials database) and communication / training. CNES participates in various sectorial activities under the MPTB, such as the Obsolescence Splinter Group (OSG), on which further details were provided. An overview of Space impacted substances addressed by REACH Annex XIV was also provided.

Regarding substitution activities CNES first elaborated on some projects investigating lead-free alternatives, including but not limited to its participation in the Advisory Board of the LETTERSS project (see above #9). Furthermore, a dedicated study addressing ECSS-Q-ST-70-05C (*Solvents and reference standards with reduced environmental impact*) which relies on two CMR substances (bis (2-ethylhexyl) phthalate (DOP)/Annex XIV and chloroform/Annex XVII) was discussed. CNES also presented the technical requirements it developed for an acceptable alternative (here: to chloroform) and a comparison of results (see Table 2 below).

Table 2 Alternatives assessment for chloroform

The examples show that finding alternatives is not trivial, also because alternatives are typically not as robust as the products to be replaced. In the case shown above, Trifluorotoluene was identified as the best alternative and was REACH compliant at the time, but could now be affected by the upcoming PFAS regulation, raising the issue of regrettable substitution.

In conclusion, CNES stressed the need to communicate and exchange information, but also anticipate, enhance the traceability of materials and processes and work together for successful substitution as part of studies, finding common approaches and possible requirements revision.

Q&A Pierre LIONNET from ASD-Eurospace asked about CNES plans for supply chain communication in France. CNES attendees replied that there is a lot of communication with the supply chain, particularly on electronics. Discussions are also held with SMEs to help them comply. On satellites, CNES work closely with local primes. An example was provided of two satellites in flight with a lead-free computer, which have worked well for 4 years now. Overall, support has been focused on R&D for 10 years.

Panel discussion

#11	**Panel Discussion** - Pierre LIONNET (Director of Research, ASD-Eurospace,) – moderator - Josef DENZEL (Senior Technical Expert and Assessor at Airbus Defence and Space, also representing ASD - Aerospace, Security and Defence Industries Association of Europe) - Hugo WAETERSCHOOT (Chemicals Advisor, Eurometaux) - Premysl JANIK (REACH Officer, ESA) Topics: - Supply chain challenges for the European Space Sector – wider context - Specific threats to industry (European capability vs. internal European regulatory constraints) - 3. Specific REACH/Regulatory challenges

P. LIONNET opened the panel by recalling that the Space Sector is a small segment with ca. 60,000 workers in Europe, covering a wide array of technologies and always looking for the best solution. It produces approximately 8-10 launch systems and 20-40 satellites per year. These systems are characterized by high complexity and very long lead development and production times. Here the regulation can drop within the lifetime and cause great issues. The sector has been facing a heavy cost and administrative burden and uncertainty from REACH, and still sometimes a lack of acceptance especially among engineers who struggle to understand why such compliance efforts are required for products sent into space. Yet, the sector is taking REACH compliance seriously. And without the ESA REACH Office the sector would not be able to monitor the legal and chemicals materials situation.

P. LIONNET then opened the floor for the panelists asking whether finding alternatives with a lot of R&D is the best solution or whether a general exemption would be preferrable?

J. DENZEL firstly noted the issue of magnitude: It may be desirable to not have substances of concern (SoCs) in products, but there is no budget to replace the estimated 50% of the materials impacted by this definition. It is also very challenging to fulfil the already existing obligations in relation to SoCs/SVHCs tracking under the Corporate Sustainability Reporting Directive. For chromates alone, a recent assessment has roughly estimated the cost to comply with the new REACH authorisation regime to be approx. 1 million of investment per company to comply with the new EHS requirements. So there is a concurrent investment in compliance cost while implementing alternatives as well where possible.

P. JANIK feels it is not right to assume that all SoCs are bad for the environment. In the Space Sector the hardware is protected from people rather than the other way around. If the risk control is there, it is difficult to understand the reason for additional regulatory constraints. He also recalls that the definition of “sustainability” includes economic sustainability as well, it can rule out many alternatives, even harmless chemicals from a hazard point of view. If we look only at REACH, we miss the point of sustainability. Ecodesign is different. Regulations and Directives are developed in isolation and do not talk sufficiently to each other.

H. WAETERSCHOOT noted that many of the issues discussed today are very common. We need to ask the question what is the biggest risk that we first want to counter as a society? PFAS is indeed a big risk. But the question is what matters? Prioritisation of what matters is therefore the first question to tackle. Substitution is a relevant action, but it can also be a closed system or the absence of an end-of-life stage. What matters is what cannot be risk-controlled. H. WAETERSCHOOT hopes that this question can be better resolved as part of a future REACH 2.0. Integration with RoHS, ELV and Batteries is currently on-going at ECHA, harmonization and bringing together laws should be promoted, with a focus first on risk control.

J. DENZEL added that industry is quite weak in the implementation of compliances programmes, knowledge is often still lacking. A recent EU-wide ECHA enforcement report for REACH Article 33 has shown a non-compliance rate of 85%. He recommends improvement of the current system rather than adding new burden.

P. LIONNET then asked whether the fact that non-compliance is not necessarily sanctioned today is a relief or concern?

J. DENZEL answered that enforcement is indeed quite weak in a lot of countries and suffers from a lack of resources, mentioning a striking example from Germany where REACH compliance enforcement in a multimillion people region is managed by one official. If we are not better in the enforcement, we will not be better in the compliance programmes.

H. WAETERSCHOOT added that more attention should be given to a level playing field across EU. He also stressed that it is important to choose the right regulatory management tool and not be too burdensome. The Risk Management Option Analysis if done properly can contribute to achieve this.

P. LIONNET added that industry often wakes up if there are real supply disruptions. Otherwise the industry may not feel concerned, if business can continue as usual. He gives the example of hydrazine anhydrous where the UN experts for the Transport of Dangerous goods agreed a detrimental packing provision last year (see presentation #6 above).

P. LIONNET further asked the panelist what is the main threat from the Regulation to the sector?

P. JANIK answers that the main threat is unsolicited obsolescence (example of 3M exit from PFAS).

H. WAETERSCHOOT concurred on the supply disruption risk. Rather than taking a top-down approach it may be better to turn it around (bottom-up approach) and ask e.g. for plating: What are the risks from substances used in the plating sector? In this case worker protection may be the appropriate approach.

J. DENZEL also agreed that supply chain disruption is a key element. The REACH Revision should come with a simplification for our industry too. The environment of uncertainty is not good for investments in Europe. He gave the example of semiconductors and PFAS. Certain material developments are no longer happening in Europe. He also reiterated the issue of obsolescence, and that exemptions will not help the space sector in such a case.

P. LIONNET then asked each panelist for a final statement.

He mentioned that when REACH appeared the sector (under ESA's leadership) started discussing with the EU. However, the initiative should be EU-driven and funding is an important part of the solution.

According to H. WAETERSCHOOT chemicals legislation should be dedicated to the supply chain.

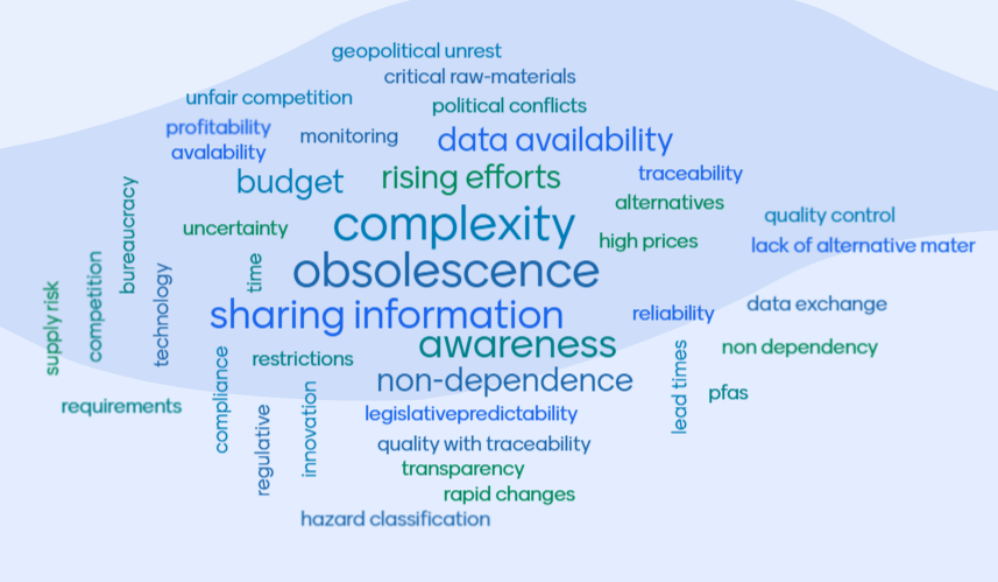
J. DENZEL is of the opinion that legislators should turn the sequence by starting with a data collection and create an inventory of targeted substances, instead of starting with a restriction proposal followed by impact assessments (e.g. PFAS inventory under U.S. TSCA).

P. JANIK feels that REACH is not the most important topic, but other challenges such as climate change and the implementation of the European Green Deal are much larger undertakings. Therefore people in organisations also need to be dedicated to addressing sustainability and circularity issues.

Attendee feedback

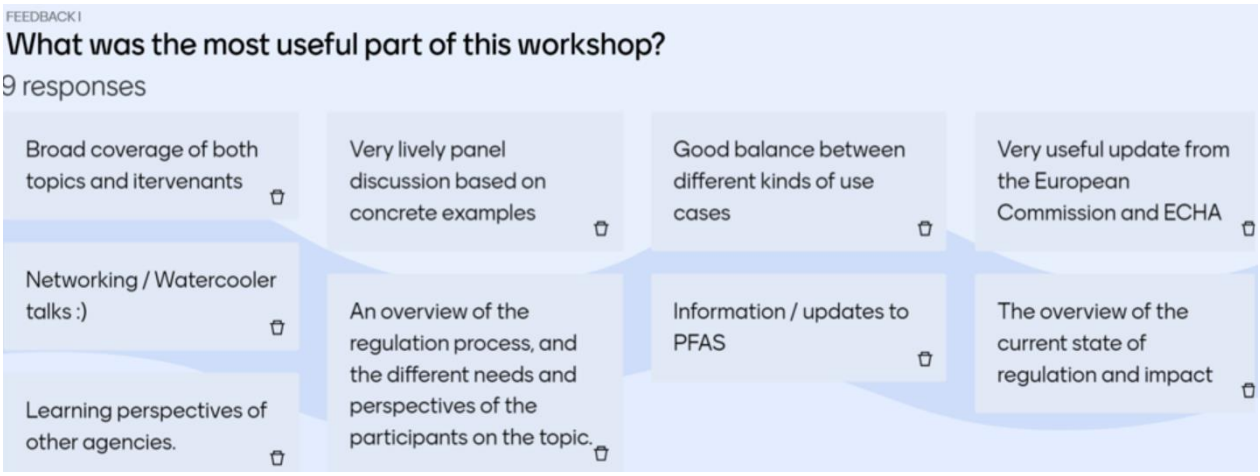
The real time Mentimeter responses (word clouds) by workshop attendees showed the following results:

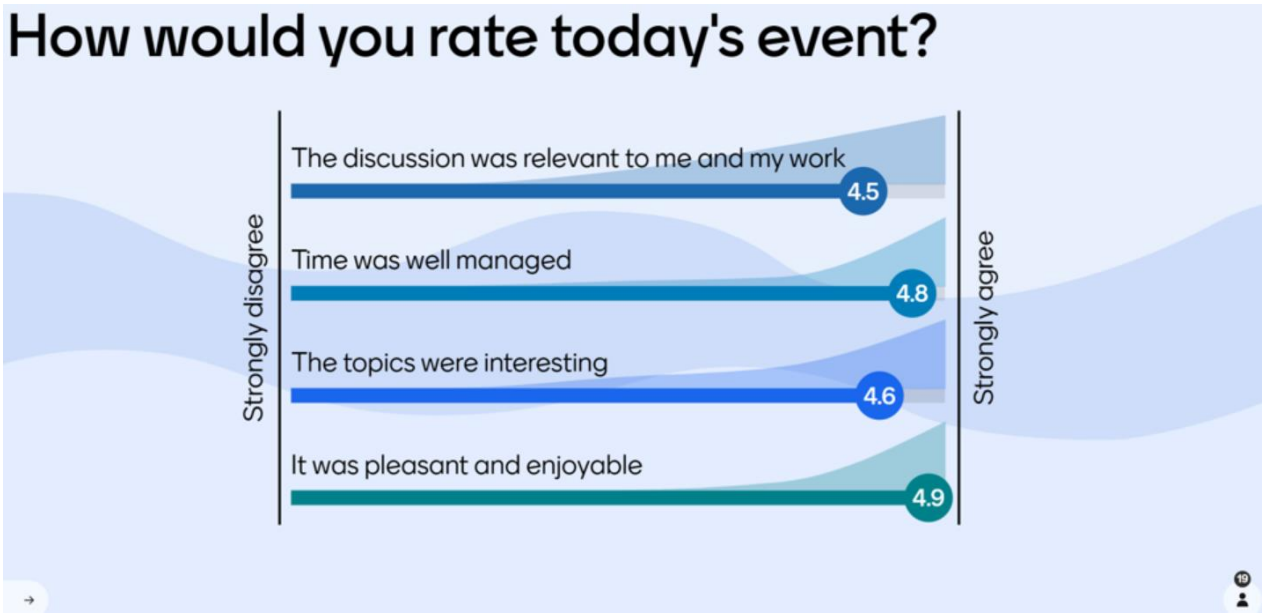
Supply chain challenges for European space sector:



What is the most challenging legal framework for your business?

Satisfaction survey:





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End of summary report