CRIN submission to the ECHA public consultation on the restriction on the manufacture, placing on the market and use of PFAS

PFAS have been found everywhere - in the environment[1], in food and beverages[2] as well as in human bodies[3]. The widespread exposure to PFAS is linked to severe health impacts, especially for children. **As such, large-scale PFAS pollution infringes a wide range of children's rights in the EU and beyond.**

The Child Rights International Network (CRIN) is a human rights organisation focused on children's rights. We are among the 125 European civil society organisations that called on the Member States and the EU Commission to ban all PFAS in consumer products by 2025 and across all uses by 2030.[4]

In this submission we are providing additional scientific and socio-economic evidence we deem relevant to the proposal tabled by the Dossier Submitter (DS) for an EU-wide PFAS restriction, corresponding to a ban with use-specific (mainly) time-limited derogations (RO2). The EU will be able to uphold children's rights against PFAS only by living up to the ambitions of this far-reaching proposal, while addressing its existing loopholes.

CRIN is an Associate member of the European Environmental Bureau (EEB). We fully align with the contribution the EEB submitted in August 2023[5], as well as EEB's statements[6] delivered during the RAC and SEAC meetings.

PFAS put all children at risk

All humans are vulnerable to the effects of exposure to PFAS, but children are more susceptible than adults on account of their smaller bodies and particular behavioural habits.[7] Children suffer from higher levels of exposure and intakes of PFAS than adults[8], and are more sensitive to it. **Impacts of exposure to PFAS can be irreversible and be passed down from one generation to the next.**[9] Exposure to PFAS, which present endocrine disrupting properties[10], significantly impacts foetal growth and foetal development with consequences on birth outcome (including preterm birth), children's development and their health as adults.[11] The joint research strategy HBM4EU reported that higher maternal PFAS levels can be associated with an **increased propensity for infections in children up to 4 years old and the frequency of use of antibiotics until adolescent age.**[12]

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[1] The Forever Pollution Project: Journalists tracking PFAS across Europe, see also Le Monde, 'Forever pollution': Explore the map of Europe's PFAS contamination, February 2023.
[2] EFSA Panel on Contaminants in the Food Chain, Risk to human health related to the presence of perfluoroalkyl substances in food, *EFSA Journal, 18(9),*September 2020; RIVM, Te veel blootstelling aan PFAS in Nederland, June 2021.
[3] Zheng, G. et al., .Per- and Polyfluoroalkyl Substances (PFAS) in Breast Milk: Concerning Trends for Current-Use PFAS, *Environmental Science & Technology*, May 2021, Serrano, L. et al., Concentrations of perfluoroalkyl substances in donor breast milk in Southern Spain and their potential determinants, *International Journal of Hygiene and Environmental Health*, 236, July 2021.
[4] Manifesto for an urgent ban of 'forever chemicals' PFAS, First published on 12 October 2022. Last updated 22 May 2023.
[5] EEB's first contribution to the public consultation on the PFAS restriction proposal, August 2023.
[6] EEB and Clientearth's joint statements available on the EEB website.
[7] WHO, Don't pollute my future! The impact of the environment on children's health, 2017.
[8] EFSA Panel on Contaminants in the Food Chain (EFSA CONTAM Panel), Risk to human health related to the presence of perfluoroalkyl substances in food, *EFSA Journal, 18(9),* September 2020.
[9] Report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes, A/HRC/33/41, August 2016, para. 2.
[10] Endocrine Society, PFAS Chemicals: EDCs Contaminating Our Water and Food Supply and Colleen S. et al., Early Life Exposures to Perfluoroalkyl Substances in Relation to Adipokine Hormone Levels at Birth and During Childhood, *Journal of Clinical Endocrinology & Metabolism*, Volume 104, Issue 11, Pages 5338–5348, June 2019.
[11] Govarts, E.et al., Combined Effects of Prenatal Exposures to Environmental Chemicals on Birth Weight, 2016; Wang, Mansem, L.S. et al., Concentrations of perfluoroalkyl substances (PFASs) in human embryonic and foetal organs from first, second, and third trimester pregnancies, March 2019; Danish Environmental Protection Agency, 'Exposure of children and unborn children to selected chemical Substances', 2017, Balbus, J.M., et al. Early-life prevention of non-communicable diseases, 2013.
[12] HBM4EU Newspaper, European Human Biomonitoring Initiative, April 2022.

**CRIN is a non-governmental organisation registered under the EU Transparency Register*
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A study conducted in 2022 assessed the perceived health risk and self-reported diseases for mothers living with contamination of perfluoroalkyl substances.[13] Scientists conducted a study on 384 mothers of children aged 1–13 years living in a contaminated area ("Red Zone") of Veneto in Italy). They reminded that PFAS exposure is associated with several adverse effects during pregnancy (e.g. preeclampsia), and **effects of PFAS exposure can also occur in the unborn child because PFAS can cross the placental barrier during pregnancy**. Among other results, the assessment found that serum PFAS concentrations increased with tap water consumption, residence in Red Zone A, and residence time. Moreover, the analysis of the self-reported diseases showed **that mothers with higher risk perception related to PFAS exposure reported more health issues and autoimmune disorders**.

Released in August 2023, the TEDDY child study assessed the association of risk factors for environmental PFAS exposure and childhood PFAS concentrations with behavioural difficulties among 331 school-age children exposed to PFAS from birth, while also controlling for the important influence of the parenting and familial environment. Delving into the neurodevelopment of children exposed to PFAS, scientists observed **cross-sectional associations of tap water consumption and childhood PFOS and PFHxS concentrations with greater behavioural difficulties**.[14] They concluded that "population screening should be conducted to monitor the exposure level of mothers and newborns, and they should be advised to **avoid potential sources of contamination".** "Although breastfeeding is a significant source of post-natal exposure, **it may affect the child**", the scientists stressed.

Moreover, a review of the existing literature and identified new exposure-outcome associations found strong evidence of the relations between perfluoroalkyl substances and child and adult obesity, impaired glucose tolerance, gestational diabetes, reduced birth weight, reduced semen quality, polycystic ovarian syndrome, endometriosis, and breast cancer.[15] Other scientific studies concluded that elevated maternal levels of PFAS substances were associated with a reduction in cognitive functions (such as working memory)[16] as well as with increased risk of ADHD and/or ASD[17] for the child.

These risks affect all children, and the problem is **magnified by factors associated with poverty and other forms of marginalisation.** The poorer health associated with economic deprivation reduces children's resilience to the effects of PFAS, particularly when children are malnourished, while the weaker regulation of industry in poorer countries allows conditions of high toxicity to persist in places where children live, learn and play. Many children impacted by PFAS pollution are already marginalised or discriminated against, and rarely have the resources to access justice when their rights are being violated.[18] Risks to be subject to PFAS exposure and resources to tackle those risks are unfairly distributed across Member States, regions and localities.[19] Moreover, PFAS pollution can create intergenerational effects that **entrench marginalisation and socioeconomic disparities experienced by affected communities.**

The Forever Pollution Project[20] found that **up to 17,000 sites are contaminated by PFAS in Europe**, and reported nearly 21,500 presumptive[21] contaminated sites (i.e. with current or past industrial activity in Europe).

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[13] Girardi, P. et al., Mothers living with contamination of perfluoroalkyl substances: an assessment of the perceived health risk and self-reported diseases, Environmental Science and Pollution Research, March 2022.
[14] Girardi, P. et al., Behavioural outcomes and exposure to perfluoroalkyl substances among children aged 6-13 years: The TEDDY child study, *Environmental Research, Volume 231, Part 2,* August 2023.
[15] Kahn, L. G., et al., Endocrine-disrupting chemicals: implications for human health, *The Lancet, Diabetes & endocrinology,* 8(8), 703–718, August 2020.
[16] Skogheim, T. S., et al., Prenatal exposure to perfluoroalkyl substances and associations with symptoms of attention-deficit/hyperactivity disorder and cognitive functions in preschool children, *International Journal of Hygiene and Environmental Health*, January 2020.
[17] Skogheim, T. S., et al., Prenatal exposure to per-and polyfluoroalkyl substances (PFAS) and associations with attention-deficit/hyperactivity disorder and autism spectrum disorder in children, *Environmental Research,* November 2021.
[18] Johnston, J. and Cushing, L., Chemical exposures, health and environmental justice in communities living on the fenceline of industry, 2020.
[19] For instance see Regione del Veneto, Piano di sorveglianza sanitaria sulla, popolazione esposta a PFAS, Rapporto n. 17, May 2023: As part of a surveillance program on concentration levels, the data extracted from the regional application Qlik PFAS Screening in the Veneto region (Italy) showed the differences in PFAS concentrations between males and females, and between several areas (A and B) located in the highly polluted Veneto's Red Area (Area Rossa). It confirmed that a longer duration of residence in the Red Area is associated with higher serum concentrations of PFOA, PFOS and PFHxS, indicating that prolonged exposure results in greater bioaccumulation of PFAS in the body.
[20] The Forever Pollution Project: Journalists tracking PFAS across Europe, see also Le Monde, 'Forever pollution': Explore the map of Europe's PFAS contamination, February 2023.
[21] Presumptive because their industrial activities, whether past or present, were documented as both users and emitters of PFAS.

In 2019, Milieu Consulting carried out a study on the costs of inaction against PFAS.[22] Among other annual health impact-related costs, it calculated the costs of mortality among communities near chemical plants, with PFAS in drinking water. Concerning the elevated risk of all-cause mortality for adults living close to PFAS contamination[23], **12.5 million people were at risk across all EEA countries**, **leading to a EUR 41-49 billion annual costs.**[24] The study also raises that there are overlaps in the calculations, since "workers and affected communities are also exposed to background levels of PFAS". Moreover, "**these costs are likely to be underestimated** due to the lack of epidemiological-based risk relationships for calculating other health endpoints and related costs". Marginalisation of the affected communities due to amplified health damages (hence amplified health costs) is not the only discrimination the PFAS contamination poses. PFAS entail other costs related to the **loss of property value, ecological damage and the costs incurred by public authorities in responding to affected communities** (e.g. public outreach, surveys of contamination, remedial measures). For instance, in 2018, the Australian government launched a $73.1 million support plan to help property owners affected by PFAS contamination, including $55.2 million to be spent across five years to give people access to safe drinking water.[25]

PFAS have been found in a huge range of products for professional and consumer use, including products commonly used in children's daily life. A study mandated by DG ENV in 2019 found **a wide range of CMR substances in childcare articles, such as several PFAS**, with several entries for pentadecafluorooctanoic acid, nonadecafluorodecanoic acid, perfluorooctanyl sulphonic acid and its salts, and perfluorononan-1-oic acid.[26]

Alongside their direct impacts on children's health, PFAS also **pollute and degrade the ecosystem and biodiversity**[27] which children and their families depend on for water, food and work[28]. PFAS are readily distributed in watercourses[29] and soil, where they accumulate in animals and plants, ending up in the human food chain. This is because "the use of soil, water, or biosolids contaminated with PFAS to grow crops, feed animals intended for food, or raise fish or other seafood, can lead to PFAS entering the food supply".[30] PFAS can be found as active substances or co-formulants in pesticides. The EEA recently stressed that pesticide levels were consistently higher in children than in adults, with children being particularly sensitive to the negative health impacts[31], ranging from (and not limited to) endocrine disorders and cancers, to heart diseases and neurological deficiencies.

Exposure to PFAS infringes children's rights

Children's rights violations entailed by the continued exposure to PFAS must be fully comprehended during the risk and socio-economic assessments of the restriction proposal. PFAS contamination violates children's rights which have been internationally recognised, and ultimately leads to significant health costs across all Member States, borne by governments, public authorities and families.[32]

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[22] Goldenman G. et al., Cost of Inaction: A Socio-economic Analysis of Environmental and Health Impacts Linked to Exposure to PFAS; *Nordic Council of Ministers*, *Copenhagen*, March 2019, see Table 1.
[23] Ibid. Calculation method further detailed in Table A2.3: Calculation of annual monetised impact of elevated mortality due to elevated PFAS exposure – Nordic and EEA countries.
[24] Ibid. See Table 40: Estimated health-related costs of exposure to PFAS at different levels of exposure
[25] Australian Local Government Association, $73.1 million package of measures for PFAS management, November 2018.
[26] DG ENV, Umweltbundesamt , Wood, Assessment of presence of CMR substances in certain categories of consumers' articles that c ould be subject of Article 68(2) of REACH, December 2019, Table 2.3 (p.25): 10 entries for Pentadecafluorooctanoic acid (CAS 335-67-1), 8 entries for Nonadecafluorodecanoic acid (CAS 335-76-2), 6 entries for Perfluorooctanyl sulphonic acid and its salts (CAS 1763-23-1), 6 entries for Perfluorononan-1-oic acid (CAS 375-95-1).
[27] Groh, K. et al., Anthropogenic Chemicals As Underestimated Drivers of Biodiversity Loss: Scientific and Societal Implications. *Environmental science & technology*, January 2022.
[28] Human Rights Watch, New Study Underscores Dangerous Levels of Chemical Pollution, January 2022.
[29] Générations Futures, Report on PFAS in surface water, January 2023; Association of River water companies (RIWA-Rijn), Water quality of the Rhine falls short of targets,September 2023.
[30] US Food and Drug Administration, Testing Food for PFAS and Assessing Dietary Exposure, May 2023.
[31] EEA, More action needed in the EU to reduce the impacts of chemical pesticides, April 2023.
[32] Report of the Special Rapporteur on Toxics to the UN Human Rights Council on the Rights of Child and Toxics, A/HRC/33/41, July 2016, para. 13, among other examples, EDCs in food and cosmetics and from other sources are estimated to burden the EU with over €100 billion in economic costs per year.

The UN Convention on the Rights of the Child (UNCRC)[33], which all EU Member States have ratified, must guide EU action. Harmful exposure to PFAS **unambiguously violates a wide range of children's rights set out in the UNCRC**. The UNCRC recognises the **right of all children to have the best possible start in life, to grow up healthy, and to develop to their full potential.**[34] In all actions concerning children, "whether undertaken by public or private social welfare institutions, courts of law, administrative authorities or legislative bodies, **the best interests of the child shall be a primary consideration".**[35]

In August 2023, the Committee on the Rights of the Child (the Committee) released General Comment 26 on children's rights and the environment, with a special focus on climate change. This highly anticipated guidance to states **urged them to "address the adverse effects of environmental degradation, with a special focus on climate change, on the enjoyment of children's rights"**, including the right to a clean, healthy and sustainable environment. It acknowledged that younger children are particularly susceptible to environmental hazards, and that the effects of environmental contaminants may even persist in future generations. According to the Committee, **States should consistently and explicitly consider the impact of exposure to toxic substances and pollution in early life**. They should "consider all factors required for children of all different ages to survive, develop and thrive to their fullest potential and design and **implement evidence-based interventions** that address a wide range of environmental determinants during the life course".[36]

The EU must also respect and uphold the EU Charter of Fundamental Rights, introduced by the Treaty of Lisbon, thus **binding all Member states with the same legal value as EU treaties.** Article 24[37] guarantees and protects the rights and best interest of the child, including the right to protection and care. In all actions relating to children, whether taken by public authorities or private institutions, **the child's best interests must be a primary consideration.** The Charter enshrines other human rights that are impacted by the exposure to PFAS, including Article 1 guaranteeing human dignity, Article 2 the right to life, Article 3 the right to integrity of the person, and Article 37 prescribing environmental protection.

In his report focusing on children's rights, the former Special Rapporteur (SR) on toxics and human rights Baskut Tuncak provided an analysis of children's rights impacted by hazardous chemicals, including the best interests of the child.[38] He raised that "the best interests of the child are best served by **preventing exposure** to toxic chemicals and pollution, and taking **precautionary measures** with respect to those substances whose risks are not well understood". He also deplored that **industrial competitiveness, risk management options and cost-benefit considerations are prioritised over the best interests of the child.** This applies to the current dossier, which could better take the child's best interests into primary consideration, further comprehend children's specific vulnerabilities and address some shortcomings in effectively restricting PFAS (further detailed below).

Children continue to be **born "pre-polluted," and are denied their right to bodily integrity before they can even walk**.[39] International law grants no derogation from the right to physical integrity (right of a person to participate in and make decisions about their own body)[40], and the SR explained that **human exposure to toxic substances constitutes an intrusion,** whether it's acute poisoning or low level exposure to toxic substances. In 2022, current SR on toxics and human rights, Marcos Orellana, stressed that plastic products expose children to endocrine disrupting chemicals (EDCs) in toys or utensils, and the **growing volumes of plastic waste also impose a debt on future generations.**[41]

Water is also a major source of exposure to PFAS, in both poor and wealthy countries. **Childhood exposure to contaminated water involves several rights violations**, including the right to life, survival and development,

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[33] UNCRC, 1989.
[34] See UNCRC Article 6 and 24.
[35] See UNCRC Article 3.
[36] Committee on the Rights of the Child, General Comment No. 26 on children's rights and the environment, with a special focus on climate change, CRC/C/GC/26, August 2023.
[37] Article 24 of the Charter of Fundamental Rights of the European Union, OJEU, December 2007.
[38] Report of the Special Rapporteur on Toxics to the UN Human Rights Council on the Rights of Child and Toxics, A/HRC/33/41, July 2016.
[39] Ibid.
[40] Ibid and Human Rights Committee, general comment No. 20, para. 3.
[41] UN Special Procedures, Opening Remarks, United Nations Special Rapporteur on toxics and human rights, Marcos A. Orellana, at the 76th Session of the UN General Assembly, May 2022

right to health, right to an adequate standard of living and a healthy environment.[42] A broad and effective restriction on PFAS can significantly contribute to mitigating water pollution. In 2020, the EFSA outlined in its scientific evaluation on the risks to human health related to the presence of PFAS in food[43] that "**toddlers and other children had approximately twofold higher mean intake** [of PFOA, PFNA, PFHxS and PFOS] than older age groups (adolescents, adults, elderly, very elderly)". Their exposure levels significantly exceed the tolerable weekly intake (TWI).

In 2021, the EU Commission unveiled the Strategy on the Rights of the Child[44], **seeking to address persisting and emerging challenges with concrete actions to protect, promote and fulfil children's rights.** The strategy is child rights-based, and as such refers to the UNCRC. Its 2nd thematic area aims to address poverty, promote inclusive and child-friendly societies, health and education systems.[45] It mentions that all children have the **right to health and to a good standard of living.** Fundamental child rights include the right to live in a clean and healthy planet, and to enjoy and respect the natural environment. **Protecting children and future parents against exposure to PFAS is a cornerstone to deliver on the Strategy's promises.**[46]

A sweeping PFAS restriction to adequately uphold children's rights

The unprecedented restriction proposal submitted by the DS is the opportunity for the EU to live up to several goals set out in its Child Rights Strategy and its Chemicals Strategy for Sustainability[47], including phasing out the use of PFAS and better protecting children.

Implementing a grouping approach

The DS appropriately used the OECD definition[48] of PFAS and scoped the restriction to tackle fluorosurfactants, fluoropolymers and fluorocarbons. Together with other existing subgroups of PFAS, **these three sub-groups of PFAS persist in the environment.** They are justifiably in the scope of the restriction and they inevitably harm the ecosystems and human health across their lifecycle, with particularly damaging effects on children.

Manufacturing fluoropolymers requires the use of hazardous fluorosurfactants that can end up in water and soil around fluoropolymer factories. Recent mapping of Europe's PFAS contamination[49] highlighted the importance of PFAS pollution from fluoropolymer manufacturing sites, hence the failure of companies to prevent such leakages. **Fluoropolymers (FPs) such as PTFE can also degrade in microplastics (MPs)**, contaminating the environment. MPs deriving from FPs present similar concerns to other MPs, but also have additional characteristics deserving more attention.[50] FP-derived MPs present severe ecological risks arising from their physical properties. Due to its high density, PTFE settles in sediments, making its removal extremely complex, if not impossible. Moreover, exposure to MPs deriving from FPs may have harmful impacts on human health. A recent study found that the toxicity associated with MPs deriving from PTFE may be specifically linked to the activation of the extracellular signal-regulated kinase (ERK) pathway, which ultimately induces oxidative stress and inflammation.[51]

Fluorocarbons also drastically contribute to environmental degradation and related adverse impacts on human health, as their production extensively contributes greenhouse gases emissions.[52]

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[42] CRIN, Submission for the Special Rapporteur's report on the subject of regulation of water and sanitation services in the context of realisation of human rights, April 2017.
[43] EFSA, PFAS in food: EFSA assesses risks and sets tolerable intake, September 2020.
[44] EU Strategy on the Rights of the Child and the European Child Guarantee, March 2021.
[45] Ibid., Thematic area 2, Socio-economic inclusion, health and education.
[46] EDC-Free Coalition, EU Strategy on the Rights of the Child to protect against harmful chemicals: time to deliver!, May 2021
[47] Chemicals Strategy for Sustainability, October 2020.
[48] EPA, A New OECD Definition for Per- and Polyfluoroalkyl Substances, December 2021.
[49] The Forever Pollution Project: Journalists tracking PFAS across Europe, see also Le Monde, 'Forever pollution': Explore the map of Europe's PFAS contamination, February 2023.
[50] Salawu and Adeleye, Adsorption of PFAS onto secondary microplastics: A mechanistic study, *ChemRxiv*, *Cambridge Open Engage*, 2023 (preprint, not peer-reviewed yet), March 2023; see also Final RAC and SEAC Opinions on Restricting the use of intentionally added microplastic particles to consumer or professional use products of any kind, December 2020.
[51] Pramod Bahadur et al., Polytetrafluorethylene microplastic particles mediated oxidative stress, inflammation, and intracellular signalling pathway alteration in human derived cell lines, *Science of The Total Environment. Volume 897,* November 2023.
[52] Dhakal, S., et al., IPCC, Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change: Emissions Trends and Drivers, Figure 2.4 (p.11), 2022.

Furthermore, **incineration - or thermal decomposition - of PFAS has not shown satisfactory results** in fully treating and degrading PFAS, and preventing these substances from ending up in the environment. In 2022, a PHD dissertation found that “some fluorinated products may escape thermal and post- treatment processes, elude detection, and be released to the environment”. As such, due to a lack of closed mass balances (>90% F accounted for), some fluorinated products can escape thermal processes and end up in the environment.[53]

No solution has proven to be hundred percent efficient in treating PFAS. Regarding the case of closed loop of fluoropolymers, developing closed-loop systems for recycling fluorochemicals presents significant shortcomings, pertaining - among other challenges - to the low rates and significant downsides of mechanical and chemical recycling. Plastic waste containing fluorochemicals is utterly difficult to collect, almost impossible to sort for recycling, is environmentally damaging to reprocess, and enormously expensive to recycle.[54] **Closed-loop chemical recycling is not a viable solution to the end-of-use problem of fluoropolymers.**[55]

From a legal and scientific standpoint, PFAS grouping will not lead to infringements of general principles of EU law. The grouping approach fully complies with the EU principles of proportionality, precaution and legal certainty. Addressing PFAS as a class and thus restricting them in a sweeping and grouping manner is grounded on science.[56] Their biopersistence and bioaccumulation as well as their other known and potential hazards have been thoroughly studied and highlighted in several independent research projects, which justifies to treat **all PFAS as a single class, divided in three sub-groups.**[57]

Moreover, the grouping approach contributes to limiting regrettable substitutions as much as possible. The OECD policy experts support this grouping approach to PFAS, considering it has “allowed for alternatives to emerge rather than industry converging to a simple substitution with substances of similar intrinsic characteristics”.[58] Regulating each PFAS individually or in small groups of closely related substances fell short in addressing concerns these substances pose, whereas phasing out as many PFASs as possible all at once can help avoid regrettable substitutions.

Limiting the transition periods and exemptions

The proposed restriction option (RO2) would allow for an 18-month transition period and use-specific time-limited derogations for several sectors. According to the DS, time-limited derogations and their duration (either 5 or 12 years) are based on socio-economic considerations and the availability of alternatives.

The longer the continued use of PFAS is allowed, the more children will be contaminated at an early age, and the more the ecosystems will deteriorate everywhere in Europe, **with irreversible aftermaths on human health and the resilience of the environment.** Each and every industry sector must contribute to, participate in and comply with the PFAS restriction. PFAS are here to stay forever, thus **even smaller emitters of PFAS are already responsible for irreversible and harmful contamination**. Food and drink are the main sources of exposure to PFAS. Other sources of exposure include (but are not limited to) consumer products such as cosmetics and toys for instance. A small amount of PFAS found in products is already too big of a risk for children’s health. Only uses which are absolutely essential to society and deemed as such after a thorough and independent assessment should be granted a longer transition period. That ought to be the case in very limited situations.

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[53] Wang, J., Thermal Decomposition Mechanisms of Per- and Polyfluoroalkyl Substances and Application to Analysis of Total Organofluorine, August 2022.
[54] Greenpeace, Report: Plastic Recycling Is A Dead-End Street—Year After Year, Plastic Recycling Declines Even as Plastic Waste Increases, May 2023.
[55] Patel, D. et al., All Talk and No Recycling: An Investigation of the U.S. “Chemical IRecycling” Industry, 2020, Hann S. and Connock T. (Eunomia), Chemical Recycling: State of Play, December 2020, NRDC, Recycling Lies: “Chemical Recycling” of Plastic is Just Greenwashing Incineration, 5–6, September 2022.
[56] Kwiatkowski, C. F. et al., Scientific basis for managing PFAS as a chemical class, *Environ. Sci. Technol*. Lett. 7, June 2020.
[57] As relevantly mentioned in section 2.2.2.1. REACH restriction, and section 1.1.2 on Justification for grouping).
[58] OECD, Regulating groups of chemicals: a cost-effective option for chemical safety, December 2020.

Many companies are making the case for getting derogations from the restriction, arguing that the uses of PFAS in their products are essential to society. **Extensively granting exemptions will utterly weaken the *raison d'être* of the restriction, falling short in efficiently protecting children across Europe.**

Only a sweeping restriction proposal can encourage the industry, especially the biggest companies, to invest in the transition efforts towards suitable and sustainable alternatives, instead of focusing on fighting for maintaining an unacceptable *status quo* in their uses of PFAS. Several frontrunners have been investing in R&D, and some alternative providers have already found viable and suitable substitutions for many consumer uses of PFAS and certain professional and industrial uses.[59] **The transition toward safer alternatives must be a collective effort from the entire industry**, i.e. both upstream and downstream users of PFAS. Decision makers now have the opportunity to incentivise such efforts and innovation by creating certainty about the future of PFAS through a broad restriction with few derogations.

Several time-unlimited derogations are proposed by the DS, such as for PFAS used as active substances in plant protection products, biocidal products, and human and veterinary medicinal products. The rationale backing such exemption is that "these are addressed under their respective regulations". However**, we found very little evidence that the level of safety required for these products is being guaranteed and achieved by existing legislation** such the Plant Protection Products regulation. With up to 70% of all pesticides introduced into the global market from 2015 to 2020 containing PFAS or related compounds,[60] pesticides represent a major source of PFAS pollution and lead to severe children's rights infringements.[61] **Integration of co-formulants in the restriction scope is relevant and much welcomed. Yet, the proposal needs to go further to better tackle this pollution.** The existing pesticides regulation is not fit for purpose in sufficiently reducing the risk of PFAS, falling short in addressing the presence of PFAS among active substances. Acknowledging the data gaps existing on PFAS environmental contamination and ingestion linked to pesticides, we would suggest adopting a **precautionary approach. PFAS as active substances used in pesticides[62] should fall under the scope of the PFAS restriction.**

A fast-delivering PFAS restriction with limited exemptions will also **contribute to ensuring a level-playing field for all EU companies** across Member States. Some countries already took action to phase out PFAS in a wide range of uses.[63] The EU-wide restriction will help harmonise and clarify the restriction on PFAS across all countries and for all EU companies, ensuring more fairness towards those companies already making the alternative efforts, and incentivising EU multinationals to lead the way regarding PFAS-free alternatives.

A far-reaching PFAS restriction will not hamper the green transition nor impair Green Deal's achievements. First, the restriction proposal provides several derogations with transition periods for green technologies, including the energy and semiconductor sectors.[64] Second, approximately only 8% of the total production volume of fluoropolymers in Europe is dedicated to renewable energy, semiconductors and pharmaceuticals.[65] Third, even for technologies such as green hydrogen, PFAS are not as necessary as some companies claim. For instance, an emerging alternative to polymer electrolyte membranes (PEMs) has been found, using non-fluorinated membranes for anion-exchange systems.[66] In the energy sector, "there is sufficiently strong evidence for the existence of technically feasible alternatives for membrane applications in PEM fuel cells, with hydrocarbon membranes, PEEK membranes being mentioned as relevant alternatives

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[59] See alternative providers' presentations delivered during the Chemsec Conference, Find out how to replace "difficult" PFAS uses with safer alternatives, June 2023, Companies developing alternatives to PFAS include Transene Company, Inc., Ionomr Innovations Inc., Sympatex and ATMOsphere.

[60] Diogo, A.M. et al., Revisiting pesticide pollution: The case of fluorinated pesticides, *Environmental Pollution*, January 2022.

[61] CRIN Position Paper, How can the EU better protect children from harmful pesticides - in Europe and beyond?, June 2023.

[62] PFAS Free, The Problem with PFAS in Pesticides, March 2023.

[63] For instance, In 2019, Denmark banned all PFAS in paper for food contact (e.g. fast-food wrappers).

[64] Restriction Dossier, Table 8, p.155, Energy sector (Annex E.2.12.) and Electronics and semiconductor (Annex E.2.11.).

[65] Wood, Fluoropolymer Product Group of PlasticsEurope Update of market data for the socioeconomic analysis (SEA) of the European fluoropolymer industry, Final report, May 2022; quoted by Chemsec, The claim that PFAS are critical to the green economy is complete hyperbole, May 2023.

[66] For example, Ionomr (Vancouver Canada) is a start-up creating non-fluorinated membranes for such anion-exchange systems, see also Mardle, P. et al., One year operation of an anion exchange membrane water electrolyzer utilizing Aemion+® membrane: Minimal degradation, low H_2 crossover and high efficiency, Journal of Power Sources Advances, January 2023.

identified through ongoing R&D."[67] Similarly, regarding semiconductors, an alternative has been developed, as the manufacturer Transene Company found PFAS-free solutions for semiconductor customers.[68]

Restricting PFAS will ultimately lead to major cost savings.[69] PFAS pollution is creating a huge financial and health burden on society. The longer PFAS contamination continues, the higher the cost of environmental remediation will be. A detailed study of the costs of inaction against PFAS conducted by Milieu Consulting for the Nordic Council of Ministers revealed that "parallel calculations for all 31 EEA countries and Switzerland arrive at **a range of costs for environmental remediation totalling EUR 821 million to 170 billion**".[70] An ambitious PFAS restriction will support the resilience of the healthcare systems across all Member States. In its socioeconomic analysis of environmental and health impacts linked to exposure to PFAS, Milieu Consulting also found that the impacts from PFAS exposure in Europe **led to annual direct healthcare expenditures between 52 and 84 billion euros.**[71] In 2015, a series of scientific studies also estimated that exposure to EDCs **likely cost EUR 157 billion ($209 billion) a year in actual health care expenses and lost earning potential.**[72] So far, families, healthcare facilities, local authorities, as well as wastewater treatments services have been paying the price of the inaction, while the burden should be carried by businesses, in line with the **polluter pays principle.**[73] Twelve companies are responsible for the majority of the PFAS production in the world, earning huge profits[74] and not sufficiently contributing to the costs of mitigation and remediation of the PFAS pollution.

Conclusion

The **UN and EU child rights frameworks should be a key compass for decision making** at the EU level, for EU institutions as well as for EU agencies. If the EU does not efficiently phase out PFAS while it has the opportunity to do so, EU institutions, Member States and businesses will continue to be responsible for not stopping long-term and irreversible contamination of children - and therefore, severely infringing upon their rights. A broad and ambitious ban on PFAS will send a crucial message to the rest of the world, inviting the phasing out of PFAS uses globally.

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[67] As mentioned in the Restriction Proposal, p. 126.
[68] Umas Lowell, "Forever Chemicals" Replaced in Materials Used by Semiconductor Industry, October 2022, mentioned by Chemsec, The claim that PFAS are critical to the green economy is complete hyperbole, May 2023.
[69] Cordner, A. et al., The True Cost of PFAS and the Benefits of Acting Now, *Environ Sci Technol, 55(14),* July 2021.
[70] Goldenman, G. et al., Cost of Inaction: A Socio-economic Analysis of Environmental and Health Impacts Linked to Exposure to PFAS; *Nordic Council of Ministers*, *Copenhagen*, March 2019.
[71] Ibid.
[72] Endocrine Society, Estimated Costs of EDC Exposure Exceed €150 Billion Annually in EU, March 2015.
[73] European Court of Auditors, Polluter Pays Principle: Inconsistent application across EU environmental policies and actions, 2021.
[74] Chemsec, The top 12 PFAS producers in the world and the staggering societal costs of PFAS pollution, May 2023.