Input Bond Beter Leefmilieu in public consultation of the Annex XV restriction report on the restriction

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General overview

As a Flanders based organisation we were confronted with a high PFAS-pollution in Zwijndrecht, near the company 3M and in the whole of Flanders. We have seen the highest concentrations in water (73 millions of nanogram/liter)[1] and in the soil of PFAS (above 1000 microgram/kg soil) in the world. According to the soil investigation reports of 3M in 2009 **9553 kg of PFOS is present in the soil**.

Due to the persistence character of PFAS the only way to reduce exposure and the amount in the environment is a restriction, or a ban on PFAS production and use. This is why we support and thank the authorities from the 5 countries: Denmark, Germany, the Netherlands, Norway and Sweden for preparing this restriction proposal.

Group approach

The pollution in Flanders is very known for the molecule "PFOS" produced by 3M in Zwijndrecht, for example. PFOS was already banned in 2008, but it is still omnipresent in water, air, blood and soil. BBL is therefore a supporter of this **grouping approach** as it is presented by the dossier submitters, including fluorosurfactants, fluoropolymers and fluorocarbons (eg. F-gasses). **The inclusion of fluoropolymers in the scope is supported by evidence that we need to look at every stage of their life cycle.** These polymers are not of low concern but of high concern if you evaluate the whole life cycle. It is unclear how much PFAS are released from fluoropolymer processing companies.

It is understood in the restriction proposal due to graphs and projections that if we use & produce PFAS much longer, the emissions and the exposure to humans and environment will

1 https://www.theguardian.com/environment/2023/feb/23/revealed-scale-of-forever-chemical-pollution-across-uk-and-europe

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continue to increase due the **persistence characteristics** and many more concerns like mobility, bioaccumulation and ecotoxicity. The (eco)toxicological reasoning for such restrictions is based on the P argument (persistent nature) and other (eco)toxicological effects. This persistent character applies to almost all PFAS-like substances. You also don't have to make the analysis of whether a substance is persistent for every substance when notifying REACH (This is the read-across principle) and that makes the basis for creating groupings.

The grouping approach is supported in the way we are talking about a group of produced substances. Besides PFOS, related substances such as POSF, PFOSA, N-EtFOSAA, ... were also produced. These have both a degradable character and a non-degradable character. The former will degrade, but then PFOS will eventually remain. Stopping only the "pure" PFOS would not have made sense. Hence, a ban for the production of all those substances (which can break down into PFOS). Production of other PFAS that can break down (such as PFBS) is still going on there.

In addition, you can fairly easily escape an individual restriction by, e.g., inventing a small variation to the banned substance (**regrettable substitution**), because the technical and (eco)toxicological properties will not change much. This is the case with GenX: it is less bioaccumulative than PFAS but still has the other characteristics (toxic and persistent). Only one property is modified, the others remain the same. Moreover, because it is less bioaccumulative and dissolves more easily in water, it also stays in water longer, causing it to enter our drinking water. Thus, a switch to GenX is not a sustainable solution. **Only a full grouping approach can stop regrettable substitution and side-effects (like breakdown, semi-incineration...) of PFAS.**

Despite a complete ban, you will also continue to have exposure from items already on the market and PFAS-waste. In other words, apart from a decent restriction, there are no realistic or practical solutions.

Toxicology of PFAS in Flanders

PFAS is everywhere, in soil, in water, in birds, seals, humans, even children and many more. For example the bird (especially tits) population around Blokkersdijk (a **Natura 2000** area near 3M[2]) was surveyed (Hoff et al., 2015a, b). This found the highest measured concentrations of PFOS for any species in nature, worldwide. Concentrations range from 553 µg/kg to 11,359 µg/kg in the liver and 24 to 1,625 µg/L in the blood. In a measurement of cabbage tit eggs in 2019, the highest measured concentration of PFOS was 187,032 µg/kg. Even field mice know about it. A 2004 study (Hoff et al., 2004) found that field mice in the area had concentrations ranging from 470 µg/kg to an already astounding 178,550 µg/kg PFOS in the liver. PFOS were also found in blood in seals in the Western Scheldt (4,947 µg/L). The measured values in seals in the Western Scheldt are significantly higher than in other areas (Hoff et al., 2003).

[2] https://www.natuurenbos.be/blokkersdijk

Due to these **high concentrations of PFAS in the soil** (and territory for the construction works), citizens in the Zwijndrecht region are still exposed to PFOS and PFAS-contaminations. This is the reason why people and children in this region still can't eat their own vegetables, play in sandboxes or eat hatched eggs from their own chickens.

A study (Defour et al., 2008) associated PFAS in cord blood and thyroid function in newborns and mothers. There was a sampling for the presence of PFAS in 221 cord blood samples collected in Belgium between 2013 and 2016. The study found that the residual contamination by PFAS in cord blood is correlated with thyroid hormone in the newborns and the risk of hypothyroid in mothers. 7 different PFAS were analyzed (PFOS, PFOA, PFHxS, PFNA, PFDA, PFHpA, and PFUdA). The following median concentrations were determined; 0.73 µg/l for PFOS, 0.68 µg/l for PFOA, 0.16 µg/l for PFHxS, 0.12 µg/l for PFNA.

Looking closer to 3M, three out of four young people[3] from the vicinity of Zwijndrecht are potentially at health risk from the so-called forever chemical PFOS. This is according to a survey of 300 young people conducted by the Flemish Institute for Technological Research VITO and three universities. This involved measuring the levels of PFAS, the group of chemicals to which PFOS belong, in their blood and in their environment. **A clear link was also established between the presence of PFAS in the blood and disruption of the immune system, hormones and pubertal development.**

The researchers measured PFAS levels in the blood of 303 young people between 12 and 17 years old who have lived within the 5 kilometres around the factory for at least five years. Samples were also taken from their surroundings: from house dust, as well as from vegetable gardens and chicken runs.

The results of the survey were announced in May 2023. They show that 3 out of 4 participants studied may be at health risk due to PFOS levels in their blood. For PFOA "only" 10 per cent of the participants surveyed were concerned. Furthermore, six different PFAS were found in the blood of all (or pretty much all) participants: PFOS, PFOA, PFHxS, PFNA, PFBA and PFDA.

Concentrations of the substance **PFOS in particular were higher than in the rest of Flanders**. This is not surprising, of course, as PFOS were made at the 3M plant (manufacturing site of PFAS). Elevated levels were mainly found south and northwest of the 3M site, in the municipalities of Zwijndrecht, Melsele and Kallo. The further away from the 3M plant, the lower the concentrations found were.

Excessive PFOS levels were found in 1 in 3 vegetable gardens, and in 1 in 4 chicken coops. Eggs from own chickens proved to be a particularly important source. As many as 78 per cent of the eggs surveyed contained too much PFOS. But consumption of local fruits and vegetables, food from shops and even the use of lubricating oil also further drive up total

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3 https://www.vrt.be/vrtnws/nl/2023/04/24/3-op-de-4-jongeren-uit-omgeving-van-3m-zwijndrecht-loopt-mogelij/

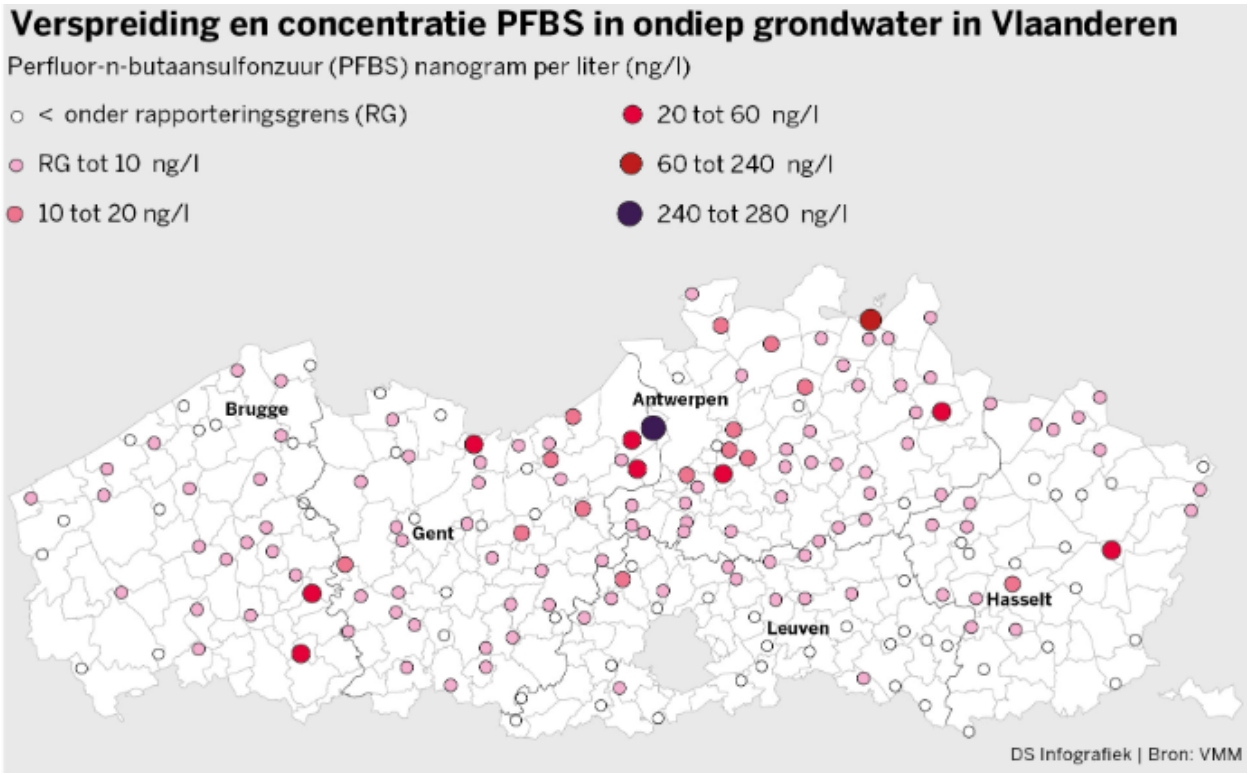
PFAS levels in the blood.

The report clearly indicates that "A higher PFAS value gives a higher probability of a health effect". Health effects found involve **disruption of the immune system and hormone functio**n. This can lead to **reduced resistance to disease and delayed growth and puberty**.

Drink-and groundwater quality in Flanders

Environmental contamination with PFAS is ubiquitous, as the substances are emitted in large numbers and enter the environment through various pathways. Due to their chemical stability, there are no natural biological or abiotic degradation mechanisms that can lead to the total mineralization (decomposition to mineral form) of PFAS. This means that PFAS can accumulate in the environment and organisms and exist in the air, water or soil for a long time. Furthermore, they are difficult and costly to treat and remove from the environment once they have entered it

Nearly 90 per cent of the monitoring wells of **shallow groundwater** in Flanders investigated by the Flemish Environment Agency[4] contain forever chemicals. This is not just about the 'old' PFOS; newer PFAS compounds have already contaminated many places. At almost 40 per cent of the monitoring points, the shallow groundwater would not pass the test of the European Food Safety Agency (EFSA).



4 https://www.vmm.be/publicaties/orienterend-onderzoek-naar-diffuse-verspreiding-van-pfas-in-het-freatisch-grondwater-in-vlaanderen-2022

For drinking water is the health advisory value (EFSA 2020) not respected everywhere in Flanders. In 13% of the analyses, the health assessment value of 4 ng/l for EFSA-4 is exceeded.

Risk management + limiting derogations

The longer we keep using PFAS, the longer PFAS will be in our environment and our bodies. It is why we need to restrict PFAS from the market, use and manufacturing. This is why it is **important to limit derogations to have a full phase out after the 18-month transition period.** Only for some exemptions, where alternatives are not yet available at the moment and where there is an essential use needed for health & safety.

If derogations are given, some conditions must be applied in order to have a clear transparency of the derogation and a lookout for a PFAS-free R&D cycle. Derogations should remain **exceptional, time limited, and should be allowed only in those cases** where industry provides clear justification; including details on how planned use(s) and exposure(s) throughout their lifecycle and the waste stream can be properly controlled and managed. We also recommend that transition periods should remain as short as possible.

1. Full disclosure of use (substances and amounts) and emissions.
2. Products containing PFAS should be labelled, to enable consumers to make an informed choice and ensure proper waste management.
3. Use case specific requirements for zero emission to the environment and zero exposure to workers, since the extreme persistency will allow even low levels of emissions to build up in the environment/human body.
4. Extended product responsibility, to ensure that the waste is treated responsibly, without any emissions.

We also underestimate the amount of emissions that are released during waste incineration of PFAS-waste. Fluorinated polymers tend not to be completely incinerated. These fluoroplastics and rubbers are made with fluorinated gases. And they are highly reactive. They will convert to ultra short PFAS. At a temperature of 350-400°C these fluorinated polymers break down into smaller molecules.

From the Indaver (waste incineration) plant in Flanders we know that PFAS are emitted by the chimneys, but it is not known how much[5]. A high temperature (1400°C) is necessary to bake the fluorine completely off the molecules (Krug et al, 2021). But Indaver only burns at around 1040°C. The Dutch Ministry demanded it to be incinerated at a level of 1100°C to really destroy all the PFAS[6].

But that is not the only problem with the incineration of PFAS-waste. These substances that are formed (ultrashort PFAS) are also strong greenhouse gases, causing climate change.

[5] https://www.standaard.be/cnt/dmf20210615_97696222

[6] https://www.vrt.be/vrtnws/nl/2023/01/13/schadelijk-pfas-mag-alsnog-van-nederland-naar-afvalverwerker-in/#:~:text=Indaver%20heeft%20een%20installatie%20in,is%20om%20PFAS%20te%20vernietigen.

Alternatives

PFAS-free alternatives have already been developed. The example from the Danish ban (2020) on popcorn bags showed that the industry could immediately provide PFAS-free alternatives. In the sector for heat pumps natural refrigerants are simply used for a long time. Goa Liu from Lawrence Berkeley National Laboratory has developed a fluorine-free binder (XiaoZhi, 2023).

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. Second, approximately only 8% of the total production volume of fluoropolymers in Europe is dedicated to renewable energy, semiconductors and pharmaceuticals. 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. 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.

Conclusion

The uPFAS restriction's unprecedented and ambitious scope sets a strong environmental and health protective framework for the future of EU citizens and the world. Bond Beter Leefmilieu supports its P-sufficient approach as a basis for the efficient and effective regulation of PFAS of concern for human health and the environment

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