30th April 2025

Urban Wastewater Treatment Directive (recast)
Cosmetics Europe analysis of the JRC list of substances found in urban wastewater as used in the EPR feasibility report

Executive summary

Upon two requests for information from Cosmetics Europe regarding Extended Producer Responsibility (EPR) feasibility report of the UWWTD, **the European Commission on 17 April 2025 provided new elements on the methodology used and granted access to the JRC database of substances found in urban wastewater** (Ref. Ares(2025)3075527 – 15/04/2025).

These new elements show a **manifest error in the attribution to the cosmetic sector of substances that are either banned for use in cosmetics, not used by cosmetics, or used by cosmetics on a marginal basis**.

This wrong allocation (by 15-fold) biased the impact assessment and led to wrongly identifying cosmetics as the second largest polluter in urban wastewater, hence generating questions on the EPR scheme and the subsequent bearing of costs.

Analysis of the methodology used in the Commission Impact assessment

- The Extended Producer Responsibility (EPR) feasibility report (Bio Innovation Study)[1] was conducted by Bio Innovation Service (the consultant) and forms part of the Commission Impact Assessment[2].
- A JRC database of 1,294 substances in total was used by the consultant to allocate each substance to various sectors, e.g., pharmaceuticals, **PCP/Personal Care Products,** insecticides, biocides, plastic additives, food etc.
- The consultant assigned each substance to one sector/consumer use.
- The toxic loads were then summed up for each sector and the relative contribution of each sector to the total toxic load was calculated.

[1] "*Feasibility of an EPR system for micro-pollutants*" (Bio Innovation Study, link to Final Report, 4th March 2022).
[2] COMMISSION STAFF WORKING DOCUMENT – IMPACT ASSESSMENT – Accompanying the document Proposal for a Directive of the European Parliament and of the Council concerning urban wastewater treatment (recast) (link, SWD(2022) 541 final).

Confusion between cosmetics products and personal care products as defined by the consultant

- The **Regulation (EC) No 1223/2009 on Cosmetic Products (CPR) defines the "cosmetic products"** as "*any substance or mixture intended to be placed in contact with the external parts of the human body (epi-dermis, hair system, nails, lips and external genital organs) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance, protecting them, keeping them in good condition or correcting body odours*".
- The **UWWTD Commission Impact Assessment** does not contain a single reference to the term "cosmetic products". It **refers to "personal care products" or "PCP"**[3], a concept not defined under EU law which does not coincide with the category of "cosmetic products" under the CPR and referred to in Annex III of the UWWTD.
- The Glossary of the Bio Innovation Study refers to "PCP or CP" as "Cosmetic Products" as defined collectively as "*A group of organic compounds that are added as ingredients to formulate a variety of cosmetic products widely used in daily human life, generally for personal hygiene, cleaning, grooming, and beautification*"[4]. The underlying studies used as reference by the Bio Innovation Study are covering the broader "PCP" category as opposed to cosmetic products[5].
- The figures used in the Commission Impact Assessment when referring to "PCP", as they are extracted from underlying studies used in the Bio Innovation Study covering the broader "PCP" category, **are not representative of the category of cosmetic products**.
- "PCP category" typically includes biocides such as insect repellents, surfactants and disinfectants that are not covered by the definition of "cosmetic products" under EU cosmetics regulation.

[3] In the Commission Impact Assessment there are only two paragraphs referring to the selection of pharmaceuticals and "PCP" for the EPR scheme (pp. 21 and 57). On page 21, it essentially provides that "*micropollutants arise from the use of many products in households. Pharmaceuticals and to a lesser extent Personal care products (PCP) represent a large share of the potentially harmful substances found in wastewater (see report 2, Annex 10)*". On page 57, it also refers to "report 2 in Annex 10" and provides that "*According to the best available data today, and recognising uncertainties on the data gathered, substances used in pharmaceuticals and personal care products (PCPs) represent the majority of micropollutant inputs and toxicity in wastewater treatment plants justifying additional investment in advanced treatment for micropollutants*".

[4] Bio Innovation Study, p. 8.

[5] Bio Innovation Study, pp. 16 and 17.

Blatant misallocation of toxic load to the Cosmetics sector

Based on the confusion between PCP and Cosmetics as described above, **the selection of the cosmetic sector is based on data on the broader category of "PCP"** and thus on data that is not accurate for cosmetic products.

- ⇨ From this misinterpretation that PCP is the same as cosmetics products, t**he Commission Impact Assessment wrongly attributed to the cosmetic sector substances either not used by cosmetics (such as permethrin, see below) or used by cosmetics only on a marginal basis compared to other sectors (such as fatty acids) or banned for use in cosmetics.**
  - The consultant allocated 119 substances to the Personal Care Products (PCP) with a toxic load of 26%, which makes the cosmetic sector the second biggest contributor to water micro pollution (*See table 1 below)*.

Cosmetics Europe analysed the JRC database and ranked the 1,294 substances according to their toxic load.

- The first **86 substances in the database account for 99% of the total toxic load** (*See table 2 below – the full database of 1,294 substances accounting for the total toxic load is available in the Annex)*.
- Out of those 86 substances, 11 are assigned to Personal Care Products by the consultant.
- **More than half of PCP's alleged contribution to the total toxic load is due to one single substance, i.e., *permethrin*.** This substance is used in insecticides used for treatment against head lice and scabies. **These products do not fall under the definition of cosmetic products in the Cosmetic Products Regulation.** One third of PCP's alleged contribution to the total toxic load is due to fatty acids that, although also used in cosmetics, are present in significant amounts in people's diet and the main source in urban wastewater is reasonably expected to be found in kitchen waste and in faeces.
- Throughout the assessment of all 1,294 substances a significant number of substances attributed to PCP are banned for use in cosmetics under the Cosmetic Products Regulation or REACH.
  - ⇨ **The 96 substances possibly used in cosmetics only account for 1.54% of the total toxic load** (*See table 3 below – the full database of 1,294 substances accounting for the total toxic load is available in the Annex*).

Conclusion:

- ⇨ The consultant analysis **overestimates the contribution of cosmetics to the toxic load by a factor of close to 15-fold** and therefore wrongly identifies cosmetics as the second largest contributor.
- ⇨ This mistake is based on several factors:
    1. A confusion between PCP (personal care products) and cosmetic products.
    2. A significant number of identified actives attributed to PCP are not used in cosmetic products and are incorrectly assigned to cosmetics.
    3. Many substances attributed to PCP are also used significantly in other consumers sectors accounting for higher use volumes than cosmetics.
- ⇨ **When rightly assessed, the JRC substances possibly used in cosmetics, account for 1.54% of the total toxic load.**

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Table 1

European Commission conclusion	Number of substances	Quantity of substances in wastewater - Load (ng/L)	Toxic load - Quantity of substances weighted by the PNEC (adimensional)	% load	% toxic load PNEC
TOTAL	1294	1,813,434	8,830	100%	100%
Pharma	348	1,078,634	5,840	59%	66%
PCP	**119**	**253,538**	**2,334**	**14%**	**26%**
Pesticide	277	125,189	173	7%	2%
Household product	25	5,186	15	0%	0%
Food product	28	120,089	69	7%	1%
Plastic additive	170	65,864	269	4%	3%
Tobacco	3	18	0	0%	0%
Other	135	109,876	20	6%	0%
Uncategorized	189	55,040	110	3%	1%
NB: Information consistent with Table 10 of 2022 EPR feasibility study (page 49)					

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Table 2

JRC database of substances found in the urban wastewater, ranked by the relative contribution of each substance to the total toxic load and allocating each substance to a particular source (consumer use sector)

	CAS number	Substance name	Organic micropollutant (Y/N)	Pollution comes from diffuse pollution (Y/N)	Potential to be covered by EPR (Y/N)	Assigned sector	Cosmetics Europe comments	Concentration in wastewater (ng/L)	PNEC	Toxic load PNEC (calculated, adimensional)	Cumulative contribution to total toxic load
1	144701-48-4	Telmisartan	Y	N	Y	Pharma		1993	0.55	3623.170	40.93%
2	**52645-53-1**	**Permethrin**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**insecticide, not used in cosmetics**	**290**	**0.2**	**1450.000**	**57.31%**
3	58-32-2	dipyridamol	Y	N	Y	Pharma		4100	5.3	773.585	66.05%
4	139481-59-7	Candersartan	Y	N	Y	Pharma		1266	3.1	408.370	70.66%
5	1951-25-3	Amiodarone	Y	N	Y	Pharma		375	1.1	340.575	74.51%
6	**112-80-1**	**oleanolic acid**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**high content in olive oil/olives, low bioavailability in humans, excreted via feces**	**18000**	**53**	**339.623**	**78.34%**
7	**57-10-3**	**hexadecaneic acid**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**Palmitic acid. Main source of these kinds of lipids/fatty**	**19000**	**91**	**208.791**	**80.70%**

							acids in UWW are kitchen waste and human excreta				
8	50-28-2	17b-Estradiol	Y	N	Y	Pharma		20	0.1	200.000	82.96%
9	1763-23-1	perfluorooctane sulfonate (PFOS)	Y	N	Y	Plastic additive		102	0.65	156.923	84.73%
10	**544-63-8**	**tetradecaneic acid**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**Myristic acid. Main source of these kinds of lipids/fatty acids in UWW are kitchen waste and human excreta**	**44000**	**290**	**151.724**	**86.45%**
11	50-32-8	Benzo[a]pyrene	Y	N	Y	uncategorized		17	0.17	100.000	87.58%
12	**112-18-5**	**N,N-Dimethyldodecylamine**	**Y**	**N**	**Y**	**PCP**	**possibly also in household cleaners**	**8906**	**110**	**80.968**	**88.49%**
13	58-08-2	Caffeine	Y	N	Y	Food product		81000	1200	67.500	89.25%
14	91161-71-6	Terbinafine	Y	N	Y	Pharma		727	11	66.087	90.00%
15	120-83-2	2,4-Dichlorophenol	Y	N	Y	Plastic additive		9005	200	45.025	90.51%
16	93413-69-5	Venlafaxine	Y	N	Y	Pharma		1509	38	39.706	90.96%
17	83905-01-5	Azithromycin	Y	N	Y	Pharma		733	19	38.587	91.39%
18	111991-09-4	Nicosulfuron	Y	N	Y	Pesticide		342	9	38.049	91.82%
19	1404-90-6	Vancomycin2H	Y	N	Y	Pharma		144	3.8	37.877	92.25%

20	**3380-34-5**	**Triclosan**	**Y**	**N**	**Y**	**PCP**	**use in cosmetics had significant drop (> 90%) in 2020**	**720**	**20**	**36.000**	**92.66%**
21	65277-42-1	Ketoconazole	Y	N	Y	Pharma		266	8.1	32.785	93.03%
22	138261-41-3	Imidacloprid	Y	N	Y	Pesticide		255	8.3	30.727	93.37%
23	134523-00-5	Atorvastatin	Y	N	Y	Pharma		247	10	24.691	93.65%
24	120068-37-3	Fipronil	Y	N	Y	Pesticide		19	0.77	24.269	93.93%
25	79617-96-2	Sertraline	Y	N	Y	Pharma		2095	91	23.023	94.19%
26	298-46-4	carbamazepine	Y	N	Y	Pharma		969	50	19.386	94.41%
27	**27176-93-8**	**nonylfenoldiethoxylaat**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**banned for use in cosmetics under REACH**	**7100**	**380**	**18.684**	**94.62%**
28	80214-83-1	Roxithromycin	Y	N	Y	Pharma		1442	83	17.378	94.81%
29	85721-33-1	Ciprofloxacin	Y	N	Y	Pharma		1544	89	17.344	95.01%
30	129-00-0	Pyrene	Y	N	Y	Plastic additive		79	4.6	17.174	95.20%
31	206-44-0	Fluoranthene	Y	N	Y	Plastic additive		105	6.3	16.667	95.39%
32	5466-77-3	- 2EthylHexyl4-methoxycinnamate	Y	N	Y	PCP		2100	130	16.154	95.57%
33	**120-40-1**	**Lauryl diethanolamide**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**widespread use in many consumers products**	**15000**	**950**	**15.789**	**95.75%**
34	57808-66-9	Domperidone	Y	N	Y	Pharma		80	5.4	14.863	95.92%
35	10540-29-1	Tamoxifen	Y	N	Y	Pharma		57	4.1	13.963	96.08%
36	158966-92-8	Montelukast	Y	N	Y	Pharma		31	2.2	13.960	96.24%
37	15545-48-9	Chlorotoluron	Y	N	Y	Pesticide		1328	100	13.275	96.39%
38	218-01-9	chrysene	Y	N	Y	Plastic additive		33	2.9	11.379	96.52%

39	28179-44-4	joxitalaminoic acid	Y	N	Y	Pharma		990	94	10.532	96.63%
40	72490-01-8	Fenoxycarb	Y	N	Y	Household product		3	0.3	10.083	96.75%
41	117-81-7	Di(2-ethylhexyl)phthalate (DEHP)	Y	N	Y	Plastic additive		13000	1300	10.000	96.86%
42	2465-59-0	Oxipurinol	Y	N	Y	Pharma		542680	57600	9.422	96.97%
43	131929-60-7	Spinosyn A	Y	N	Y	Pesticide		25	2.7	9.175	97.07%
44	846-49-1	Lorazepam	Y	N	Y	Pharma		842	96	8.766	97.17%
45	118-42-3	Hydroxychloroquine	Y	N	Y	Pharma		570	71	8.028	97.26%
46	139755-83-2	Sidenafil	Y	N	Y	Pharma		188	25	7.530	97.35%
47	2642-71-9	Ethyl azinphos	Y	N	Y	Pesticide		7	1.1	6.545	97.42%
48	15687-27-1	Ibuprofen	Y	N	Y	Pharma		6500	1000	6.500	97.49%
49	28159-98-0	Cybutryn (Irgarol)	Y	N	Y	Pesticide		16	2.5	6.400	97.57%
50	66753-07-9	Terbuthylazine-2-hydroxy	Y	N	Y	Pesticide		46	7.3	6.320	97.64%
51	7782-49-2	Selenium (Se)	N	NA	N	uncategorized		630	100	6.300	97.71%
52	846-50-4	Temazepam	Y	N	Y	Pharma		440	71	6.197	97.78%
53	78649-41-9	Iomeprol	Y	N	Y	Pharma		900	150	6.000	97.85%
54	15307-86-5	Diclofenac	Y	N	Y	Pharma		294	50	5.873	97.91%
55	108-95-2	fenol	Y	N	Y	Pesticide		42400	7700	5.506	97.97%
56	54-31-9	Furosemide	Y	N	Y	Pharma		3904	710	5.498	98.04%
57	7439-92-1	Pb	N	NA	N	uncategorized		6200	1200	5.167	98.09%
58	486-66-8	Daidzein	Y	N	Y	Other		15000	3080	4.870	98.15%
59	**47221-31-8**	**Dodecylbenzenesulfonic acid**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**use in household detergents**	**581**	**120**	**4.838**	**98.20%**
60	120067-83-6	Fipronil sulfide	Y	N	Y	Pesticide		58	12	4.833	98.26%
61	60-54-8	Tetracycline	Y	N	Y	Pharma		1890	500	3.781	98.30%
62	94-75-7	2,4-D (Dichlorophenoxyacetic acid)	Y	N	Y	Pesticide		73	20	3.661	98.34%

63	78-42-2	Tris(2-ethylhexl)phosphate	Y	N	Y	Plastic additive		135	39	3.472	98.38%
64	330-54-1	Diuron	Y	N	Y	uncategorized		238	70	3.399	98.42%
65	96829-58-2	Orlistat	Y	N	Y	Pharma		26	8	3.188	98.46%
66	**128-37-0**	**butylhydroxytoluene (BHT)**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**widespread use in many consumers products**	**1200**	**380**	**3.158**	**98.49%**
67	1634-04-4	methyl-tertiair-butylether	Y	N	Y	Other		30000	10000	3.000	98.53%
68	7440-48-4	Co	N	NA	N	Other		800	280	2.857	98.56%
69	94-74-6	MCPA	Y	N	Y	Pesticide		1382	500	2.765	98.59%
70	25057-89-0	Bentazone	Y	N	Y	Pesticide		264	100	2.642	98.62%
71	7311-30-0	N-Methyldodecylamine	Y	N	Y	uncategorized		259	100	2.588	98.65%
72	584-79-2	Allethrin	Y	N	Y	Household product		59	24	2.475	98.68%
73	333-41-5	Diazinon	Y	N	Y	Pesticide		25	10	2.460	98.70%
74	23893-13-2	anhydro-erythromycine	Y	N	Y	Pharma		610	250	2.440	98.73%
75	256-96-2	Iminostilbene	Y	N	Y	Pharma		540	230	2.348	98.76%
76	7440-43-9	Cd	N	NA	N	uncategorized		180	80	2.250	98.78%
77	191-24-2	Benzo[ghi]perylene	Y	N	Y	uncategorized		17	8.2	2.073	98.81%
78	7440-31-5	Sn	N	NA	N	Other		4000	2000	2.000	98.83%
79	84-69-5	diisobutylftalaat	Y	N	Y	Plastic additive		2200	1110	1.982	98.85%
80	90729-43-4	Ebastin	Y	N	Y	Pharma		5	2.8	1.918	98.87%
81	56-55-3	benzo(a)antracene	Y	N	Y	Other		23	12	1.917	98.90%
82	**120-72-9**	**indol**	**Y**	**N**	**Y**	**PCP – incorrectly assigned to cosmetics**	**Natural component of feces**	**3890**	**2080**	**1.870**	**98.92%**
83	93-65-2	Mecoprop	Y	N	Y	Pesticide		187	100	1.867	98.94%

84	7440-02-0	Ni	N	NA	N	Plastic additive		7400	4000	1.850	98.96%
85	34256-82-1	Acetochlor	Y	N	Y	Pesticide		24	13	1.846	98.98%
86	604-75-1	Oxazepam	Y	N	Y	Pharma		670	370	1.810	99.00%

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Table 3

Cosmetics Europe conclusion	Comment	Number of substances	Quantity of substances in wastewater - Load (ng/L)	Toxic load - Quantity of substances weighted by the PNEC (adimensional)	% load	% toxic load PNEC
TOTAL		1294	1,813,432	8,830	100%	100%
Pharma		348	1,078,633	5,840	59%	66.14 %
PCP	**possibly correctly assigned to cosmetics**	**96**	**120,080**	**136**	**7%**	**1.54%**
PCP - incorrectly assigned to cosmetics	**at least 23 substances – incorrectly assigned to cosmetics (e.g., banned for use in cosmetics or known not to be used, such as *permethrin*, or minor use in cosmetics compared to other consumers uses)**	**23**	**133,457**	**2,198**	**7%**	**24.89 %**
Pesticide		276	125,191	173	7%	1.96%
Household product		25	5,185	15	0%	0.17%
Food product		28	120,088	69	7%	0.78%
Plastic additive		170	65,863	269	4%	3.05%
Tobacco		3	18	0	0%	0.00%
Other		135	109,877	20	6%	0.22%
Uncategorized		190	55,040	110	3%	1.25%